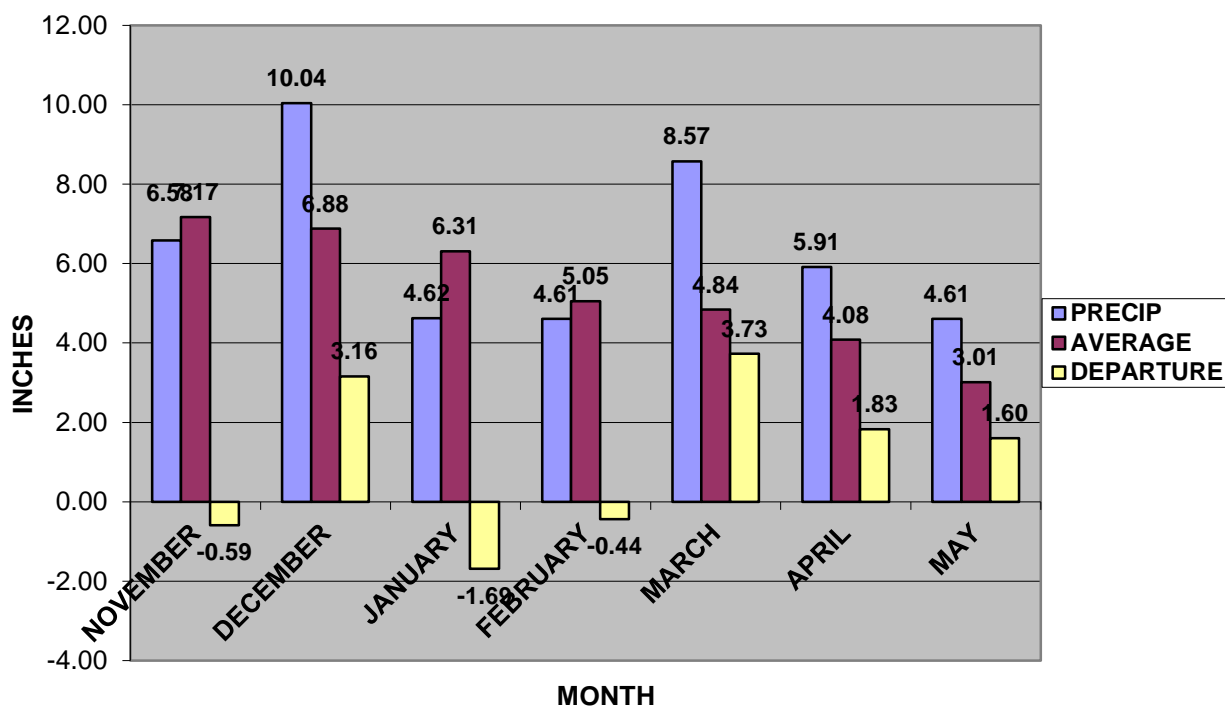


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2010-2011 WET SEASON OAKRIDGE



2011 FAST FACTS: On August 24th and 25th a major lightning outbreak resulted in a two-day total of close to 10,000 strikes across Oregon, Southern Washington and extreme Western Idaho. The lightning event marked the beginning of the most critical fire weather period for the 2011 season. This lightning episode resulted in hundreds of starts, a few of which resulted in the deployment of various Incident Management Teams. One of these fires was the 88-acre Substitute Fire. It was detected around 1738 PDT on August 24th 14 miles southeast of McKenzie Bridge in the Three Sisters Wilderness. A Type III Incident Management Team assumed command of the fire on September 5th.

The first warned Red Flag event of the 2011 season occurred September 3rd and 4th. Initially, the warning was for dry and unstable conditions. However, it became apparent that wind and low humidity would be another hazard as offshore flow developed. The strong east wind on September 3rd pushed the Dollar Lake fire several miles to the west. One of the more east-wind prone RAWs stations, 3-Corner Rock, in the Gifford Pinchot N.F., registered 10-minute sustained speeds of 25-30 mph. Log Creek RAWs, in the Bull Run Watershed of the North Oregon Cascade Foothills, had gusts to 37 mph. Larch Mountain RAWs, in the South Washington Cascade foothills north of Washougal, had gusts up to 50 mph. Afternoon humidity values of 10 to 20 percent were common in the Cascade and foothill fire weather zones. An extreme value of 8 percent was noted at Boulder Creek RAWs, in northern zone 608. The coast was not immune to the hot and dry conditions on the 3rd. Tillamook RAWs recorded a minimum humidity of 14%. Village Creek, in the Central Oregon Coast Range had a minimum humidity value of 17%.

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2010-2011 GOVERNMENT CAMP SNOW DEPTH DATA

The 2010-2011 Government Camp snow-depth data (Figure 5) is shown on page 14. The chart also includes data from 2009-2010 and the average snow depth. There is about a two-week data gap for the 2010-2011 winter season. The Government Camp snow depth data is taken from the Cooperative Observer (COOP) report and collected by the Portland National Weather Service Office. In the past, the COOP report would be phoned into the Weather Office by Government Camp personnel. Last year, a change was made to have the observers enter the data via a software program. The COOP data is also collected by the National Climatic Data Center (NCDC) and archived. The switch from the phone-in method, to the web-based program occurred in December 2010, and may have resulted in a data discontinuity. On November 30th the snow depth was 60 inches, but on December 1st the depth was listed as 26 inches in the December 2010 NCDC Climatic Data publication. Weather conditions at the time do not support a 34-inch one-day decline. The snow depth data was suspect through December 12th, and was not used for the chart.

November 2010 was a stellar month for snowfall. A foot of snow was on the ground November 11th, but dwindled to zero on the 16th. However, by the 30th the snow depth was up to 60 inches, which was the second-highest snow depth for the season. Note the steady decline in from December to mid-February. Snow depth briefly fell to zero on February 11th and 12th. La Nina kicked into full gear thereafter. A 15-inch gain on February 24th brought the snow depth to 39 inches. By the end of February there were 48 inches on the ground. The peak snow depth occurred at the beginning of March. An 18-inch gain on March 1st brought the snow depth to 66 inches, which was the highest reading of the winter. There appeared to be another data discontinuity on April 1st. On the 1st the snow depth reading fell from 38 inches to 12 inches. Snow depth hovered around normal values through much of April, but showed another spike at the end of April. The snow depth was still 30 inches on May 1st, about 17 inches above normal. Snow depth hit zero on May 18th, a few days later than last year. Snow cover vanishes, on average, by June 10th.

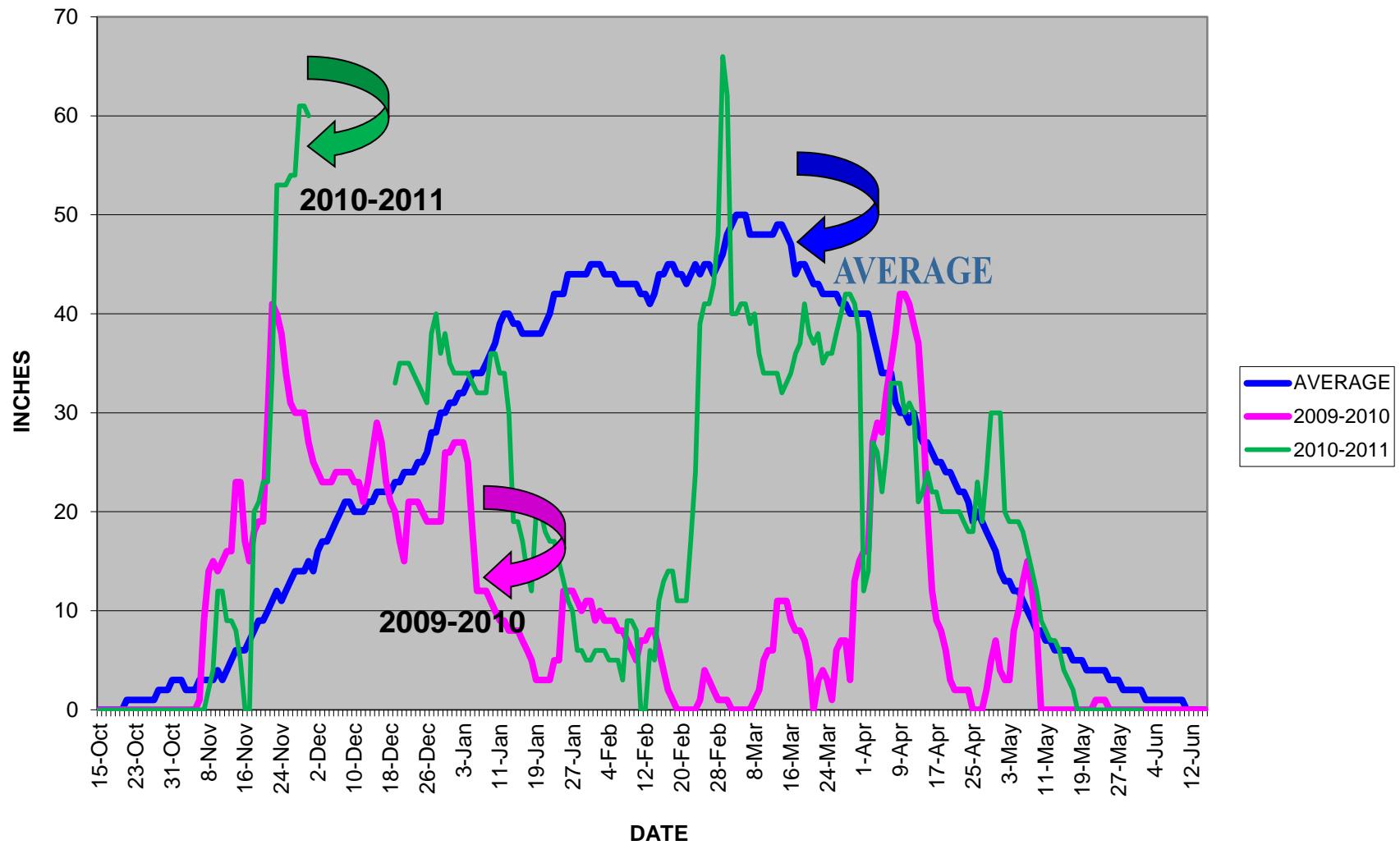
GOVERNMENT CAMP SNOW DEPTH TRIVIA: The average snow depth on Christmas Day is 25 to 30 inches. On Christmas Day 2008 there were 72 inches on the ground, which was the most since 2002. December 2004 was a horrible time for snow, with just 3 inches on the ground Christmas Day. In 2010, the Christmas Day snow depth was 32 inches.

The largest single-day snow depth increase in 2010-2011 was 20 inches on November 18th. There was an 18-inch gain from February 28th to March 1st, and a 15-inch increase from February 22nd to the 23rd.



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FIGURE 5 - GOVERNMENT CAMP SNOWDEPTH



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2011 FIRE SEASON LIGHTNING DATA

Table two shows the lightning frequency, by area, for the 2011 season.

**TABLE 2 - 2011 LIGHTNING DATA
(MAY THROUGH OCTOBER)**

AREA	# LIGHTNING DAYS 2010	AVE. # DAYS (LAST 16 YEARS)	PERCENT AVE.
ZONES 601/612	1	6.50	15.4%
ZONES 602/603	3	7.88	38.1%
ZONE 604	5	8.50**	58.8%
ZONES 605/607/660	6	12.13	49.5%
ZONES 606/608	8	14.00	57.1%

**** Average over 18-year period.**

TABLE TWO: 2011 LIGHTNING FREQUENCY.
DATA OBTAINED FROM BLM LIGHTNING DETECTION AND NORTHWEST COORDINATION
CENTER

Overall, 2011 was another below-normal lightning year for the Portland forecast area. The primary lightning period was at the end of August, when critical fire weather conditions started to develop. In the Central Oregon Cascades and foothills, zones 606 and 608, four of the eight total lightning days occurred August 21-31. Lightning data was collected from May 1st through October 20th. The coastal strip was nearly devoid of lightning activity during the fire season. There was just one lightning day in zones 601 and 612, which was the lowest in at least 16 years. The previous low was 2 days in 2010. Another interesting observation is the similar lightning frequency for the Cascade zones. Typically, zones 606 and 608 receive more lightning than zones 605, 607, and 660. In 2011, the North Oregon and South Washington Cascade zones had about the same number of lightning days as the Central Oregon Cascades. There were several occasions when lightning developed in the South Oregon Cascades and then moved north along the Cascade Crest into zone 608. By the time the thunderstorms exited the north end of zone 608, there seemed to be enough west component to push them onto the east Cascade slopes, missing zone 607.

The most notable lightning event occurred August 24th through the 25th. Unfortunately, this was a missed Red Flag condition. Hundreds of fire starts resulted from this episode, and a few of those grew into large fires. Data obtained from the BLM lightning web page showed over 8,300 total strikes in Oregon and Washington from 0500 on the 24th through

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0500 on the 25th. An additional 1,300 strikes were noted from 0500 on the 25th to 0500 on the 26th. Lightning activity diminished substantially after this late-August event. Lightning developed in the Willamette N.F. on September 7th. The last lightning day for the forecast area was October 5th, and it was confined to the coast and coastal waters.

Climatologically, the first major lightning episode occurs around July 21st. Normally, one or two critical fire weather patterns or events occur during the fire season that likely result in problematic lightning. Such events include the breakdown of an upper ridge, Haines 6 conditions, or lightning after an extended dry period. These isolated events cause the majority of large fires. The Portland Forecast Office issued Red Flag Warnings for two events during the 2011 season. One was for dry and unstable conditions, but was revised to include wind and low humidity due to offshore flow. The second Red Flag event was a long-duration episode of dry and unstable conditions, low humidity and a short-period lightning threat. The most critical fuel conditions during the past couple of seasons have occurred in early to mid-September, and this year was no exception. Fuel conditions went from average or below-average in mid-August to extreme, 97th percentile values or greater, in early September. The highest daily average ERC values occurred September 6th through 11th.

The lightning criteria for the Portland forecast area were modified four seasons ago in an attempt to better represent the true problem patterns. Dry lightning is hard to forecast and harder still to verify. The Northwest Coordination Center developed a more objective analysis for problem lightning. The general premise is to combine lightning potential with observed and forecast fuel conditions. A Red Flag Warning is warranted when lightning is expected **AND** fuel conditions are forecast to remain moderate or critical during and after the weather event. Also, lightning activity must be scattered, or greater, in coverage.



Figure 6 – Substitute Fire August 26, 2011. Courtesy of USFS

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RED FLAG WARNING STATISTICS FOR 2011

Table three shows the Red Flag verification statistics for the 2011 fire season.

TABLE 3 - (ALL WARNINGS)

ZONE	# RFW	CORRECT RFW (A)	INCORRECT RFW (B)	MISSED EVENTS (C)	POD A/(A+C)	CSI A/(A+B+C)	FAR (1- [A/(A+B)])
601	0	0	0	0	0.00	0.00	0.00
612	0	0	0	0	0.00	0.00	0.00
602	1	1	0	0	1.00	1.00	0.00
603	1	1	0	1	0.50	0.50	0.00
604	1	1	0	0	1.00	1.00	0.00
605	2	2	0	1	0.67	0.67	0.00
606	1	1	0	1	0.50	0.50	0.00
607	2	2	0	1	0.67	0.67	0.00
608	2	2	0	1	0.67	0.67	0.00
660	2	2	0	0	1.00	1.00	0.00
TOTALS (ALL)	12	12	0	5	0.706	0.706	0.000
LIGHTNING	0	0	0	5	0.000	0.000	1.000
WIND/RH	1	1	0	0	1.000	1.000	0.000
HAINES 6	11	11	0	0	1.000	1.000	0.000

NUMBER OF WARNED EVENTS: 2
EVENTS PRECEDED BY A WATCH: 2 OR 100%
MISSED EVENTS: 1

NOTE: Refer to the Annual Operating Plan for complete Red Flag criteria.

EVENT LEAD TIMES

Tables 4 and 5 show the respective warning and watch lead times for all events in 2011.

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TABLE 4 – WARNING LEAD TIMES

EVENT	RANGE OF LEAD TIMES	AVE. ZONE LEAD TIME
<i>September 3-4 (Dry and Unstable)</i>	0 LEAD TIME ZONE 605	14 HRS 56 MINS
	19 hrs 54 min ZONE 607	
	19 hrs 54 min ZONE 608	
	19 hrs 54 min ZONE 660	
<i>September 6-12 (Dry and Unstable, wind/RH, lightning)</i>	6 hrs 15 min ZONE 602	17 HRS 52 MINS
	6 hrs 15 min ZONE 603	
	6 hrs 15 min ZONE 604	
	23 hrs 14 min ZONE 606	
	23 hrs 14 min ZONE 608	
	25 hrs 14 min ZONE 660	
	26 hrs 14 min ZONE 605	
	26 hrs 14 min ZONE 607	
OVERALL AVE. LEAD TIME		16 HRS 53 MINS

TABLE 5 – WATCH LEAD TIMES

EVENT	RANGE OF LEAD TIMES	AVE. ZONE LEAD TIME
<i>September 3-4 (Dry and Unstable)</i>	38 hrs 00 min ZONE 607 38 hrs 00 min ZONE 608 38 hrs 00 min ZONE 660 NO WATCH ISSUED ZONE 605	28 hrs 30 min
<i>September 6-12 (Dry and Unstable, wind/RH, lightning)</i>	41 hrs 17 min ZONE 606 41 hrs 17 min ZONE 608 43 hrs 17 min ZONE 660 43 hrs 58 min ZONE 602 43 hrs 58 min ZONE 603 44 hrs 17 min ZONE 605 44 hrs 17 min ZONE 607 NO WATCH ISSUED ZONE 604	43 hrs 12 min
OVERALL AVE. LEAD TIME		37 HRS 51 MINS

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A few notes on verification and the 2011 events: The overall severity of any fire season is highly correlated with the extent and frequency of critical fire weather patterns during the season. It is not unusual to have an extended dry period during any given fire season. This, in itself, could result in an elevated degree of fire activity, provided the fuel conditions are right. However, to elevate a high fire danger situation to a critical level normally requires an additional weather element, or trigger, to be superimposed on the dryness factor. This additional trigger could be thunderstorms with no appreciable precipitation, an extremely unstable air mass (Haines 6), or a combination of strong wind and low humidity. Red Flag warnings are issued when a combination of critical weather elements exist **WITH** sufficiently dry fuels and severe burning conditions.

Determining lead-time for problematic or dry lightning is highly subjective. The Portland office has made a major effort to get away from the term *dry lightning*. In 2004, new lightning criteria were introduced to the users. However, the definition of episode lightning was misunderstood. Therefore, in 2005, the phrase *lightning with no appreciable precipitation* was introduced. The general premise was to avoid the subjectivity of determining whether lightning was wet or dry. If the fuel conditions were expected to remain high or critical during and after the lightning event, then a Fire Weather Watch or Red Flag warning was warranted. The Northwest Coordination Center developed a scheme to monitor fuel conditions. The two correlating factors were determined to be Energy Release Component (ERC) and 100-hour fuel moisture. It was found that there were distinct breakpoints of ERC and 100-hour fuel moisture that corresponded to minimal or no large fire potential, an average risk of large fire potential, and a higher than average risk of large fire potential.

It is a given that fires **WILL** occur during or after a lightning episode following an extended dry spell. However, does that fact alone warrant a Red Flag warning? If all the resultant fires remain small and/or initial attack can handle them, was it a critical event? Should one or more resultant lightning fires get big, then it is reasonable to assume the event was critical and a warning justified.

There were no changes in the Red Flag criteria for the 2011 season. As a review, the wind/low RH criteria are based on distinct geographic and climatic zone groupings. The Portland fire weather region is divided into five regions, and Red Flag criteria for wind and low humidity were assigned to each region. It is also assumed that if one fire weather zone within a region reaches criteria, then, by default, the remaining zones within the region achieves criteria. It is hard to imagine a synoptic-scale east wind event, typical of late spring or late summer, that verifies in the North Oregon Cascade foothills, but **DOES NOT** verify in the adjacent North Oregon Cascades or South Washington Cascades. Verification of wind and low humidity continues to be hampered by RAWS issues. The land agencies have put forth more effort at RAWS maintenance during the past couple of years, but more work needs to be accomplished. Some RAWS sites that were good wind stations in the past, have suffered due to overstory growth, understory expansion, and other environmental factors.

Another verification problem arises when verifying warnings by zone. Multiple zones may be included in a warning, but some areas may not have good verifying observing stations. Some zones end up not meeting warning criteria simply because there are no

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good verification stations. This, in turn, will result in lower Probability of Detection (POD) scores, and higher False Alarm Rates (FAR). Moving RAWs stations may actually hinder verification. There has been a push in the past couple of years for units or districts to conduct seasonal surveys on their RAWs stations and take appropriate action to clear brush, remove trees, etc. in order to conform to RAWs site standards.

NFDRS VERIFICATION STATISTICS FOR 2011

National Fire Danger Rating System (NFDRS) forecasts remain a high priority at the Portland office. Users depend on these forecasts for a variety of reasons, such as determining whether to limit or curtail forest activities, updating pocketcards, and determining staffing levels. A Memorandum of Understanding (MOU) between the Pacific Northwest Coordinating Group (PNWCG) and National Weather Service used to exist, that specified expected forecast performance measures for NFDRS forecasts. These verification standards were based on performance against persistence. The base performance measures were 35 percent improvement over persistence for temperature, 25 percent improvement for humidity, and 10 percent for wind. However, the MOU also called for a goal of 30 percent improvement each year. Over time, this 30 percent annual improvement became unreasonable. The MOU no longer exists. As of 2008, user expectations were simply to show some degree of improvement over time.

The Portland office switched to all-points NFDRS forecast in 2009, instead of zone trend forecasts. It was shown by neighboring forecast offices that individual point forecasts yielded higher verification scores versus zone trend forecasts. Prior to 2009, the Portland office provided individual NFDRS forecasts for eight sites: Village Creek, Pebble, Fields, South Fork, Wanderer's Peak, Horse Creek, Yellowstone, and Canyon Creek. Table six (next page) shows the 2011 NFDRS verification stations for the above-listed sites. The values in red indicate improvement over the 2010 scores.



Figure 7 – Retardant drop

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TABLE 6 – 2011 SITE-SPECIFIC NFDRS VERIFICATION

SITE	TEMPERATURE			HUMIDITY			WIND		
	FCST MAE	PERS. MAE	SCORE	FCST MAE	PERS. MAE	SCORE	FCST MAE	PERS. MAE	SCORE
Village Creek	4.42	7.00	36.86%	8.67	13.64	36.44%	0.92	1.07	14.02%
Pebble	3.55	6.80	47.79%	10.37	17.15	39.53%	1.49	1.59	6.29%
Fields	3.55	6.54	45.72%	10.16	15.58	34.79%	2.17	2.50	13.20%
South Fork	3.56	6.38	44.20%	9.81	17.80	44.89%	1.66	1.78	6.74%
Wanderer's Peak	4.07	7.40	45.00%	9.19	15.13	39.26%	1.16	1.24	6.46%
Horse Creek	3.62	5.98	39.46%	9.83	13.18	25.42%	1.01	1.01	0.00%
Yellowstone	5.34	8.51	37.25%	11.19	17.76	36.99%	1.36	1.56	12.82%
Canyon Creek	5.07	8.53	40.56%	11.42	18.46	38.14%	1.41	1.61	12.42%

MORE 2011 NFDRS VERIFICATION TIDBITS:

The 2011 fire season was a tale of two general weather patterns, which created some interesting NFDRS-forecasting trends. The first half of the fire season, mid-April through July, had several big-change days. These were opportunities to make big points against persistence. Big-change days can occur in many ways. For instance, a day could be dry with relatively low afternoon humidity, but the next day could be cloudy or even rainy, resulting in much lower afternoon temperatures and much higher humidity. This happened frequently in the spring and early summer. The 24-hour temperature change was as much as 20-25 degrees. May was an extremely successful month for NFDRS forecasters. The overall May temperature score was almost 55%, while the humidity score was also 55%. Even the wind score was 12%, the second-highest monthly wind score for the season.

The second half of the season was dominated by varying degrees of onshore flow and persistent weather patterns. There were frequent bouts of onshore flow throughout the summer, which resulted in a marine layer. Some of the marine surges were stronger than others, creating a deeper and more persistent marine layer. The marine layer creates havoc for the NFDRS forecaster. If the marine clouds dissipate a little sooner or later than expected, NFDRS verification scores can suffer. August was a difficult NFDRS forecasting month. The average persistence errors were 5.00 degrees and 10.80 percent humidity. The 10.80 percent humidity error was the lowest, by far, during the season. Forecasters only managed a 13% improvement over persistence during August. The overall improvement over persistence in 2011 for the eight key sites was higher at nearly all locations, compared to 2010. Wind scores showed a

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major improvement, even at those sites that exhibit relatively low wind speeds or minimal variability.

Forecasters showed improvement in humidity at all key sites. The forecaster Mean Absolute Error (MAE) was about the same as last year, but the persistence MAE was much larger. The biggest improvement was in the wind category. Five of the eight stations had better wind scores, and none were negative. Stations such as Village Creek, Horse Creek, and Wanderer's Peak typically reported 10-minute wind speeds of 3 mph or less at NFDRS time. It is difficult to beat persistence when the average NFDRS wind speed is 1 to 2 mph.

The following table (Table 7) shows the 2011 NFDRS verification statistics by zone, and the overall scores. Improvement in temperature and RH are shown in blue. Improvement in wind is shown in blue, positive wind score but no improvement from 2010 is in purple, and red wind scores indicate lower scores compared to 2010.

TABLE 7 – 2011 NFDRS VERIFICATION

ZONE	TEMPERATURE	HUMIDITY	WIND
601	32.9%	26.7%	3.7%
602	37.4%	33.6%	12.9%
603	30.7%	30.7%	4.1%
604	34.4%	25.7%	8.8%
605	42.3%	32.5%	-1.4%
606	34.9%	29.6%	4.6%
607	44.9%	40.4%	0.2%
608	47.2%	37.0%	7.5%
612	19.7%	23.3%	5.1%
660	40.9%	35.9%	13.2%
ALL	37.4%	32.2%	7.5%
2010 ALL	38.5%	28.1%	5.5%
2009 ALL	40.5%	33.7%	4.0%

The overall 2011 results showed a slight decrease in temperature performance, but a 15 percent improvement for humidity. The 7.5 percent wind score was a new seasonal record. Note the upward trend in wind scores during the past three years. The 2011 forecaster temperature and humidity MAEs were nearly identical to the 2010 values. The biggest change was the persistence humidity MAE. In 2010 the persistence MAE was 14.10 percent, while in 2011 it jumped to 15.27 percent. May was an extremely variable

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month, with numerous big-change days. The average persistence humidity MAE was a whopping 24.93 percent.

The wind scores continue to show annual improvement, especially during the past three years. This year, six of the 10 fire zones had better wind scores than the previous year, which was the same trend as last year. However, last year two zones had negative wind scores. This year, only zone 605 ended on the negative side. Part of the reason for a negative wind score in zone 605 can be attributed to the lack of observation sites. In 2011, Horse Creek RAWS and Eagle Creek RAWS were the only stations sampled. Locks RAWS was thrown out due to poor data quality. Furthermore, Horse Creek RAWS has an average afternoon wind speed around 2 mph, making it very difficult to beat persistence. The 2011 MAE for wind at Horse Creek was 1.01.

Wind continues to be a difficult element to forecast due to limited variability. There were many stations with a 10 percent or greater improvement over persistence. In general, those stations with a persistence wind MAE of 2.0 or greater showed the best forecaster improvement. Forecasters did quite well at stations such as Abernathy Mountain (+16.0%), Tidewater (+22.2%), Fields (+13.3%), and Three-Corner Rock (+17.3%). The above-listed sites had a wind MAE of at least 2.5. Conversely, stations that had the worst wind scores, such as Rye Mountain (-18.8%), Trout Creek (-18.7%), and Miller (-8.5%), had an MAE of 1.15 or less. Rye Mountain had a wind MAE of 0.49. Under seasonal conditions, forecasters typically forecast a 24-hour wind speed trend of zero, one, or two mph. However, there are times when forecasters can make significant wind-score points at sites such as Three-Corner Rock, Larch Mountain, and Abernathy Mountain. These are prominent east-wind locations. Big points can be made if there is a major change or reversal in the low-level gradient.

Big-change days are crucial to positive NFDRS statistics. These are golden opportunities to make big points over persistence. Marine surges typically offer the forecaster a chance to obtain plenty of points over persistence. Conversely, marine surges can be the most difficult pattern for NFDRS forecasts. The marine layer may be deeper or shallower than expected, which results in large mean absolute errors. Strong onshore flow could persist for multiple days, but the forecaster may believe the pattern will change sooner. This also results in large errors over persistence. The extent, or lack, of a marine layer and its dissipation heavily influences sites along the coast, in the Coast Range and Willapa Hills, Willamette Valley, and the Cascade foothills.

NEW FOR 2012:

A new Columbia Gorge fire weather zone may be established.

RAWS CHANGES:

Three-Corner Rock, and Elk Rock (zone 660), and Huckleberry (zone 601), continue to be functional on a seasonal basis. Washington DNR normally brings those stations back to service in mid to late June, depending on snowpack conditions.

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STATISTICS FOR AREA ONE (COASTAL STRIP ZONES)

This area is comprised of zones 601 and 612. RAWs that represent the area include:

Cedar Creek, Cannibal Mountain, Goodwin Peak, Huckleberry, Dunes, and Tillamook.

	TEMPERATURE		RELATIVE HUMIDITY				FUELS		PRECIPITATION			LTG
			3 OR MORE RAWs MEET CRITERIA FOR 2 HOURS						MEDIAN VALUES			
DATE	AVE MAX	AVE MIN	AVE MIN	DAYS <26%	AVE RECOVERY	NIGHTS <61%	ERC	100 HR	DAYS ≥ .01	DAYS ≥ .10	DAYS ≥ 0.25	DAYS
May 1-10	56.1	39.4	63.4	0	98.9	0	0.11	23.36	6	4	2	0
11- 20	57.6	39.7	61.2	0	96.4	0	1.40	22.30	7	3	1	0
21- 31	53.8	40.8	67.8	0	99.6	0	0.89	22.66	10	6	5	0
June 1-10	60.1	46.3	66.5	1	96.6	0	0.22	20.42	3	1	0	0
11-20	58.6	45.3	73.8	0	99.4	0	0.44	22.96	6	3	0	0
21-30	62.9	47.4	65.8	0	98.7	0	2.76	20.54	5	3	1	0
July 1-10	67.3	47.8	56.5	0	96.7	0	6.34	17.58	1	0	0	0
11-20	62.5	50.2	77.6	0	99.9	0	2.40	23.02	6	6	1	0
21-31	68.8	50.2	64.5	0	98.6	0	8.42	18.38	1	0	0	0
Aug 1-10	68.0	49.5	63.7	0	99.3	0	15.50	17.02	0	0	0	0
11-20	70.2	49.1	55.4	0	95.1	0	23.06	15.82	0	0	0	0
21-31	70.7	53.4	61.1	0	97.3	0	23.49	16.53	2	0	0	0
Sept 1-10	75.6	54.1	44.8	0	78.4	5	34.90	13.14	0	0	0	0
11-20	65.9	49.5	68.1	0	99.0	0	22.96	18.56	3	1	1	0
21-30	68.2	50.9	62.3	0	98.3	0	13.82	21.18	3	3	2	0
Oct 1-5	54.8	45.8	85.5	0	100.0	0	1.83	27.29	5	5	4	1
11-20												
AVE/TOT.	64.89	48.10	64.04	1	96.78	5	10.86	19.74	59	35	17	1
2010	64.15	47.64	64.51	2	96.21	2	16.07	18.46	47	29	20	2
2009	65.69	49.39	60.94	2	95.22	6	15.87	16.79	35	21	11	10
2008	64.0	48.5	64.3	0	92.6	21	12.55	17.62	45	26	15	2
2007	63.5	48.0	63.2	3	93.8	18	15.49	16.94	53	29	19	6
2006	66.7	49.3	55.6	8	85.8	41	23.1	15.0	35	21	16	5
2005	64.9	49.0	63.5	2	91.5	27	13.7	18.1	65	36	24	18
2004	66.2	51.0	64.5	2	92.2	13	9.6	18.3	55	36	29	13
2003	66.5	49.9	58.9	5	88.6	22	31.4	13.8	32	19	14	14

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DRY SPELL							
2011	2010	2009	2008	2007	2006	2005	2004
60 DAYS	58 DAYS	29 DAYS	48 DAYS	29 DAYS	63 DAYS	60 DAYS	53 DAYS

AREA HIGHLIGHTS

OVERVIEW: The 2011 fire season, like 2010, was fairly benign. Unusually cool and wet conditions persisted through the spring, and into mid-July. There were more days when the median precipitation was between a tenth of an inch and one-quarter inch, compared to last year. There were six such days between June 1st and June 20th, and another six days in mid-July. Lightning was nearly non-existent. There was one lightning day, and that occurred in early October. This was the third consecutive year that the number of nights with an average humidity of 60 percent or lower was less than 10. There were five occurrences in 2011, all of which took place during the critical fire-weather period September 1-10.

Average ERC values lagged behind seasonal normal through early August. The average 10-day average ERC value first exceeded 10 during early August, and then jumped to 35 by September 10th. However, by the end of September, the average ERC value had fallen to 14. The average 10-day ERC value exceeded 30 once, compared to twice last year. The average daily ERC value was 40 or higher on 4 occasions, with a peak of 42.4 on September 10th. Last year the highest daily average was 40.8. The most critical period, based on fuel conditions alone, seemed to be the end of August through mid-September.

The dry spell, defined as median precipitation of less than one-tenth of an inch, was 60 days, nearly identical to the 58-day stretch last year. The dry spell occurred from July 18th through September 16th. Although the number of wetting rain days, defined as average precipitation of 0.25 inches or more, was slightly lower than 2010, the frequency of lesser amounts was higher. The frequency of onshore flow events kept daytime temperatures down with higher humidity.

RAWS NOTES: Data collection ended October 5th.

TEMPERATURE

The seasonal average of 64.9 was 0.74 degrees warmer than 2010.

The warmest 10-day period: September 1-10 (75.6 degrees).

Number of days when the average high was 85 degrees or higher: 0

Highest daily average high: **83.0 on September 3rd.**
82.5 on September 10th.

Highest temperatures: *Cannibal 91 on September 10th.*
Cedar Creek 91 on September 10th.
Cannibal 90 on September 3rd.
Tillamook 90 on September 3rd.

Number of nights the average low was 65 degrees or greater: **0.**

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Highest average nightly low:	59.0 on September 9th.
Highest low temperatures:	<i>Goodwin 67 on September 10th. .</i> <i>Cedar Creek 67 on September 10th.</i> <i>Cedar Creek 67 on September 9th.</i>
Coldest low temperature:	<i>Cedar Creek 32 on May 1st.</i> <i>Tillamook 32 on May 1st.</i>

HUMIDITY

There was one critical daytime humidity day during the season, and only two in 2009 and 2010. Critical daytime humidity was defined as a daily RAWS average of 25 percent or less. There were five critical humidity nights this year, compared to two in 2010. The lowest 10-day average maximum humidity was 78.4 percent in early September. This was a period dominated by offshore low-level flow. The lowest 10-day minimum humidity was 44.8 during the same period.

Lowest daily average minimum humidity:	24.5% on June 4th. 25.7% on September 3rd.
Lowest single-station minimum humidity:	<i>Cannibal 8% on September 20th.</i> <i>Tillamook 14% on September 3rd.</i> <i>Cannibal 18% on June 27th.</i>
Number of nights with recovery 55% or less:	0
Lowest nighttime average:	67.8% on September 4th. 68.7% on September 10th. 71.5% on September 7th.
Lowest single-station maximum humidity:	<i>Cannibal 41% on September 4th.</i> <i>Cedar Creek 44% on September 10th.</i> <i>Goodwin 45% on September 4th.</i>

PRECIPITATION

Maximum 24-hour (daily) precipitation:	Huckleberry 3.18 on September 26th. Dunes 1.38 on October 4th. Dunes 1.37 on May 26th. Goodwin 1.30 on September 25th.
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FUELS

The 2011 season-average ERC of 10.9 was a little more than 5 points lower than 2010, and the lowest seasonal average since 2004. There were four 10-day periods with an average ERC of 20 or higher, slightly less than the 5 of last year. The first occurrence was during the period August 11-20, which was a month later than last year. The 2011 10-day average ERC value continued to lag behind 2010 through the end of August. A prolonged offshore pattern in early September resulted in a peak 10-day average of 34.9 by September 10th. Relatively dry conditions persisted through late September, unlike last year when there were six wetting rain days in the first three

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weeks of the month. The lowest 10-day 100-hour fuel moisture average was 13.14, which occurred from September 1-10. Last year the lowest 10-day average 100-hour fuel moisture value was 14.06.

Critical ERC Days (40 or higher):	4.
Highest daily average ERC:	42.4 on September 10 th . 40.6 on September 9 th . 40.2 on September 11 th .
Highest single-station ERC:	Goodwin 51 on September 7 th . Goodwin 50 on September 10 th . Cannibal 50 on September 10 th .
Number of days 100-hr FM was 12 or less:	7 0 days of 10 or less.
Lowest daily 100-hr FM:	10.8 on September 11 th . 11.2 on September 7 th , 9 th , and 10 th . 11.4 on September 6 th and 8 th .
Lowest single-station value:	7 – Cedar Creek on September 11 th . 8 – Cedar Creek on Sept. 9 th and 10 th .
Highest daily 100-hr FM:	32.8 on October 12 th . 31.6 on October 5 th .

ERC/100-HR 2010 AND 2011

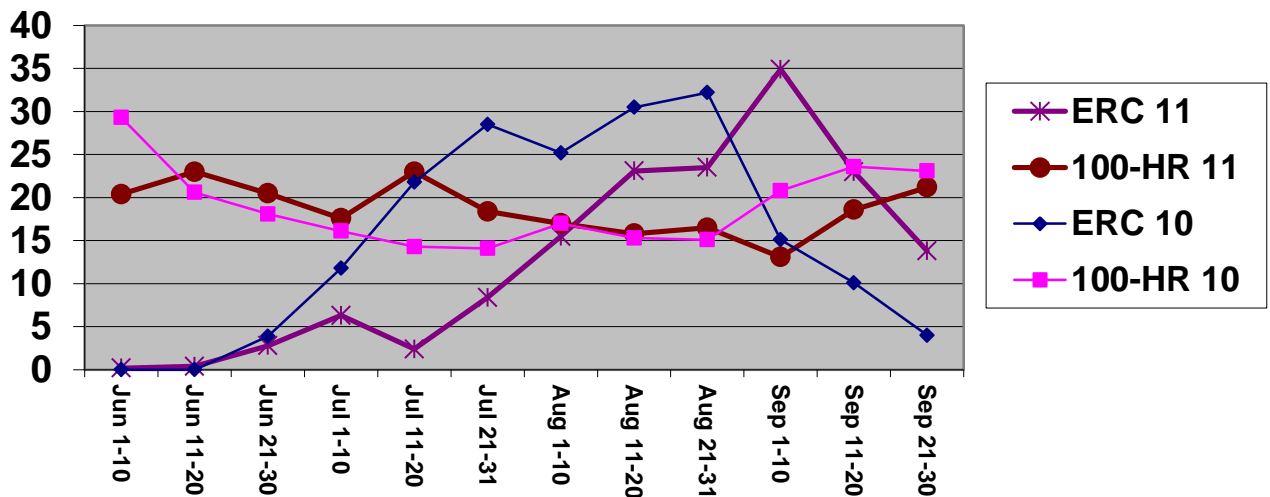


Figure 8 – Fuel Indices Zones 601 and 612

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STATISTICS FOR AREA TWO (COAST RANGE)

This area is comprised of zones 602 and 603. RAWs that represent the area include:

South Fork, Miller, Rye Mountain, Rockhouse1, Wilkinson Ridge, Village Creek, High Point, and Abernathy Mountain..

	TEMPERATURE		RELATIVE HUMIDITY				FUELS		PRECIPITATION			LTG
			4 OR MORE RAWs MEET CRITERIA FOR 2 HOURS						MEDIAN VALUES			
DATE	AVE MAX	AVE MIN	AVE MIN	DAYS <26%	AVE RECOVERY	NIGHTS <61%	ERC	100 HR	DAYS ≥ .01	DAYS ≥ .10	DAYS ≥ 0.25	DAYS
May 1-10	56.1	37.6	58.3	0	97.7	0	2.35	20.85	6	2	0	0
11- 20	58.8	39.2	52.7	1	93.1	0	1.90	19.63	6	1	0	1
21- 31	53.3	39.9	65.2	0	97.7	0	2.43	19.89	10	5	4	0
June 1-10	62.5	45.6	60.6	0	95.1	0	3.12	18.51	3	1	0	1
11-20	62.2	44.8	64.3	0	97.9	0	5.63	18.46	5	1	0	0
21-30	66.2	47.4	57.4	0	96.2	0	11.31	17.09	4	1	0	0
July 1-10	74.5	48.9	41.3	0	91.4	0	20.38	14.64	1	0	0	0
11-20	65.1	49.6	68.7	0	98.7	0	11.45	20.03	6	4	2	0
21-31	75.1	51.0	49.0	0	94.5	0	20.22	15.78	1	0	0	0
Aug 1-10	75.2	50.6	50.4	0	96.4	0	27.33	14.95	1	0	0	0
11-20	76.8	51.1	42.1	1	90.3	0	32.98	14.26	0	0	0	0
21-31	78.0	54.5	46.8	0	93.9	0	34.10	14.47	0	0	0	1
Sept 1-10	84.7	57.5	27.5	7	71.6	1	45.09	11.31	0	0	0	0
11-20	69.6	50.5	58.4	0	96.1	0	33.43	16.28	2	0	0	0
21-30	71.2	51.5	52.1	0	93.5	0	23.51	18.95	3	3	0	0
Oct 1-5	55.2	45.4	79.8	0	99.1	0	5.86	24.86	5	4	2	0
11-20												
AVE/TOT.	69.06	48.36	53.12	9	93.58	1	19.00	17.22	53	22	8	3
2010	69.38	48.07	53.73	6	93.40	1	19.83	17.58	43	25	15	7
2009	71.65	49.78	48.88	10	92.84	4	25.74	14.46	29	13	6	14
2008	71.1	49.4	49.4	12	86.7	30	26.27	14.16	31	17	8	8
2007	69.3	48.8	56.0	5	93.0	16	22.45	15.00	42	18	12	6
2006	72.9	50.1	46.3	18	86.2	37	30.2	13.7	30	18	9	8
2005	70.8	50.2	51.9	9	88.8	23	23.1	15.8	55	25	13	20
2004	71.5	50.6	54.9	8	93.4	14	17.9	16.3	45	29	16	20
2003	73.0	50.4	48.5	16	88.2	13	33.7	13.7	25	15	7	14

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DRY SPELL							
2011	2010	2009	2008	2007	2006	2005	2004
68 DAYS	80 DAYS	46 DAYS	68 DAYS	38 DAYS	63 DAYS	83 DAYS	53 DAYS

AREA HIGHLIGHTS

OVERVIEW

Overall, the 2011 fire season had several characteristics in common compared to 2010. The seasonal average temperature, humidity, and fuel conditions were nearly identical. The primary differences were fewer wetting rain days and less lightning activity. There were 10 more days with median precipitation of 0.01 inches to 0.10 inches. There was just one critical humidity night, defined as an average humidity recovery of 60 percent or less. This continues a trend of minimal critical humidity nights since 2009. Seven of the nine critical humidity days occurred during the first 10 days of September. There were 8 wetting rain days, compared to 15 last year. The three lightning days were the fewest since at least 2003, and was well below the seasonal average.

Seasonal fuel conditions were nearly identical to the 2010 season. The seasonal average ERC was 19.0, less than a point lower than last year. The peak 10-day average ERC was 45.1, which exceeded the 97th percentile, and was almost 7 points higher than last year's 10-day average maximum. Last year the 10-day average ERC did not exceed 40. Critical ERC conditions, defined as a daily average of 45 or higher, occurred on 7 days, 5 more than last year. The highest daily average was 52.5 on September 10th, which was above the 99th percentile. Similar to all other areas, the period of highest fire potential was short. The most critical part of the fire season was mid-August through mid-September. Fuel conditions started to abate around September 20th. A wet period from September 26th through October 5th put an end to the season.

RAWS NOTES: Data collection ended October 5th. Clay Creek data was not used.

TEMPERATURE

The seasonal average of 69.1 was 0.3 degrees cooler than 2010.

The warmest 10-day period: **September 1-10 (84.7 degrees).**

Number of days when the average high was 85 degrees or higher: **15.**

Highest daily average high: **91.4 on September 10th.**
90.5 on September 7th.
88.9 on September 4th.

Highest temperatures: **Village Creek 96 on September 7th.**
Rye Mountain 96 on September 10th.
Village Creek 95 on August 23rd and September 10th.
Rockhouse 95 on September 7th.

Number of nights the average low was 65 degrees or greater: **1.**

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Highest average nighttime low:	<i>64.9 on September 10th. 62.9 on September 7th. 62.0 on September 9th.</i>
Highest low temperatures:	<i>Rockhouse 71 on September 10th. Rockhouse 69 on September 7th and 9th. South Fork 69 on September 9th and 10th.</i>
Coldest low temperatures:	<i>Miller 31 on May 1st. Abernathy Mtn. 32 on May 12th. Village Creek 32 on May 2nd.</i>

HUMIDITY

There were nine critical daytime humidity days during the season, compared to six in 2010. Critical daytime humidity was defined as at least four RAWS stations recording a minimum humidity of 25 percent or less. The lowest 10-day average minimum humidity was 27.5 percent September 1-10. This 10-day period was, by far, the most critical period of the 2011 season. The 10-day average humidity recovery during early September was just 71.6 percent, about 20 percent lower than the next lowest 10-day period.

Lowest daily average minimum humidity:	<i>21.0% on September 4th. 22.8% on September 6th. 23.1% on September 3rd.</i>
Lowest single-station minimum humidity:	<i>South Fork 12% on September 10th. Rockhouse 13% on August 17th. Rockhouse 16% on August 18th.</i>
Number of nights with recovery 55% or less:	0.
Lowest nighttime average:	<i>58.4% on September 10th. 61.9% on September 4th. 64.0% on September 9th.</i>
Lowest single-station maximum RH:	<i>Rockhouse 33% on September 4th. Rockhouse 35% on September 10th. Rockhouse 37% on September 9th.</i>

PRECIPITATION

Maximum 24-hour (daily) precipitation:	<i>South Fork 1.00 on September 26th. Miller 0.94 on September 18th. Wilkinson 0.91 on May 26th. Village Creek 0.88 on May 26th.</i>
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FUELS

The 2011 season-average ERC of 19.0 was just slightly lower than the 19.8 of last year, and was the lowest since 2004. The 2011 average ERC was tracking nearly identical to 2010 through early July. A significant wetting rain from July 15th through the 17th lowered the 10-day average ERC to 11.5 on the 20th. The 10-day average ERC was 29.5 at the same time last year. The 10-day average ERC exceeded 30 during the period August 11-20, and then peaked at 45.1 by September 10th. However, by September 30th, the 10-day average had fallen to 23.5.

The average 100-hour fuel moisture fell to 10 or lower on 7 days. The lowest daily average was 8.5 on September 11th. The lowest single-station value was 6, recorded at Rockhouse RAWS on September 10th and 11th, and also South Fork RAWS on the 11th.

Critical ERC Days (45 or higher):	7.		
Highest daily average ERC:	52.5 on September 10 th . 51.4 on September 11 th . 50.9 on September 9 th .		
Highest single-station ERC:	Rockhouse 70 on September 10 th . Rockhouse 68 on September 9 th and 11 th . <i>NOT ROCKHOUSE:</i> Village Creek 58 on September 10 th .		
	Rockhouse exceeded 55 on 11 days.		
Number of days 100-hr FM was 10 or less:	7.	Days of 8 or less:	0
Lowest daily 100-hr FM:	8.5 on September 11 th . 9.4 on September 7 th and 10 th . 9.6 on September 8 th and 9 th .		
Lowest single-station value:	Rockhouse 6 on Sept. 10 th and 11 th . South Fork 6 on September 11 th .		
Highest daily 100-hr FM:	30.75 on October 12 th . 28.9 on October 5 th . 27.5 on October 7 th .		

2011 WILDFIRE STATISTICS: Based on information obtained from the Northwest Coordination Center (NWCC), there were 39 fires in Washington and Oregon that were 1000 acres or larger. The largest fire was the High Cascades Complex in North-Central Oregon. This incident was 108,154 acres, with a suppression cost of almost \$30 million. This complex was one of several caused by the August 24th lightning outbreak.

One of the longer-duration fires was the Cactus Mountain Fire in Northeast Oregon. It was detected on September 7th and was not contained until September 28th. The Cactus Mountain fire scorched 8,350 acres. The longest-duration fire, according to NWCC data, was the Dollar Lake Fire. A majority of the 1000-acre or greater fires occurred in grassy fuels and lasted 5 days or less.

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MAX T/MIN RH 2010 AND 2011

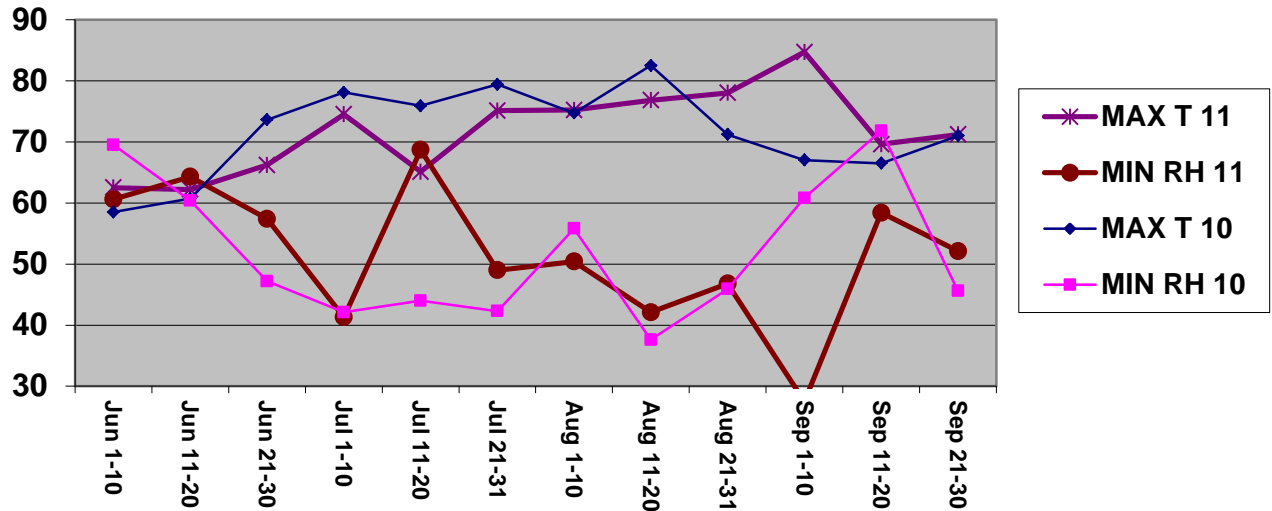


FIGURE 9 – MAX TEMP AND MIN RH ZONES 602 AND 603

2011 PRECIP MAY - JULY

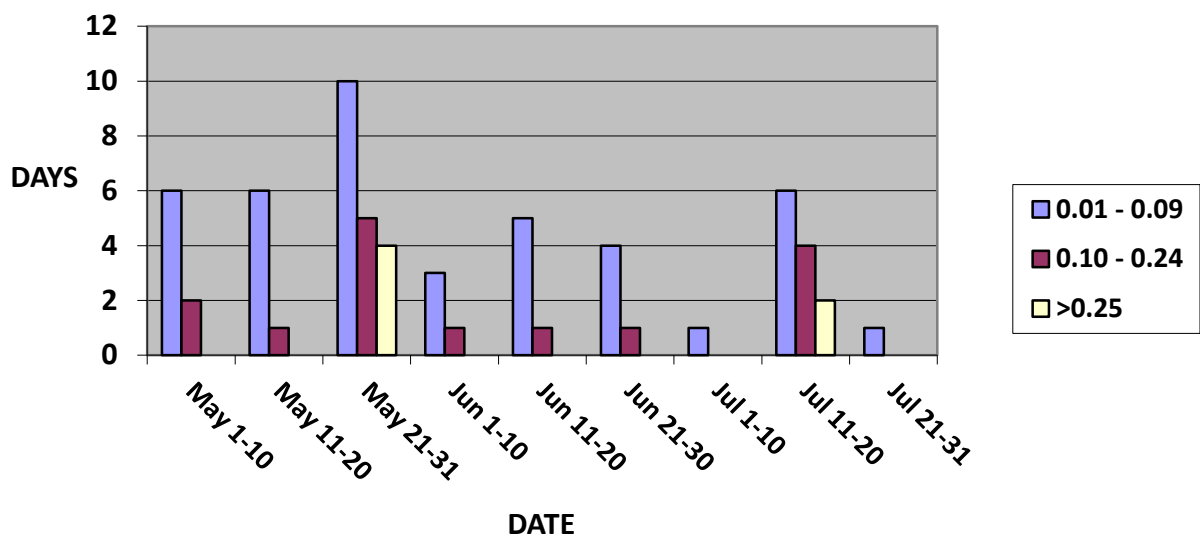


FIGURE 10 – PRECIPITATION FREQUENCY DISTRIBUTION

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STATISTICS FOR AREA THREE (SOUTH WASHINGTON CASCADES, NORTH OREGON CASCADES, AND FOOTHILLS)

This area is comprised of zones 605, 607 and 660. RAWs that represent the area include: *Log Creek, Red Box Bench, Horse Creek, Eagle Creek, Elk Rock, Buck Creek, Canyon Creek, 3-Corner Rock, Locks, Dry Creek, and Wanderer's Peak.*

	TEMPERATURE		RELATIVE HUMIDITY				FUELS		PRECIPITATION			LTG
			6 OR MORE RAWs MEET CRITERIA FOR 2 HOURS						MEDIAN VALUES			
DATE	AVE MAX	AVE MIN	AVE MIN	DAYS <26%	AVE RECOVERY	NIGHTS <61%	ERC	100 HR	DAYS ≥ .01	DAYS ≥ .10	DAYS ≥ 0.25	DAYS
May 1-10	54.2	35.3	56.2	1	95.6	0	0.00	27.03	5	3	2	0
11- 20	60.0	36.8	45.4	0	93.1	0	0.36	26.72	5	3	1	1
21- 31	50.5	39.0	69.3	0	95.7	0	1.40	22.19	10	5	3	1
June 1-10	61.2	44.1	59.2	1	91.4	1	3.76	17.18	2	2	0	1
11-20	60.5	43.4	58.5	0	96.5	0	6.24	16.96	5	2	1	0
21-30	66.3	45.7	53.1	0	95.1	0	10.14	16.82	4	1	0	0
July 1-10	74.2	46.5	36.7	1	86.8	0	17.74	15.01	0	0	0	0
11-20	63.7	48.1	68.4	0	98.0	0	10.51	19.15	5	3	1	0
21-31	72.4	50.1	50.4	0	93.8	0	16.94	17.17	2	0	0	0
Aug 1-10	72.6	50.7	50.0	0	94.3	0	23.89	15.39	0	0	0	0
11-20	75.3	49.8	39.6	3	86.8	1	29.46	14.35	0	0	0	0
21-31	76.2	54.5	46.4	0	89.9	0	30.58	14.55	1	0	0	3
Sept 1-10	84.4	56.1	24.1	7	64.4	6	41.18	12.02	0	0	0	0
11-20	69.9	49.8	52.8	1	93.2	0	33.56	15.90	3	3	0	0
21-30	71.7	48.9	43.5	1	86.5	1	22.23	17.53	3	2	2	0
Oct 1-5	53.4	43.8	78.5	0	98.9	0	6.10	25.69	5	4	1	0
11-20												
AVE/TOT.	68.25	47.19	50.08	15	90.56	9	17.39	17.76	50	28	11	6
2010	67.85	46.94	51.81	13	91.65	7	20.05	17.27	47	36	23	6
2009	70.22	48.79	45.46	27	88.81	11	24.75	15.30	32	16	7	12
2008	68.4	48.2	50.0	19	87.5	40	20.50	16.25	44	25	9	8
2007	67.5	47.3	50.8	13	89.6	17	24.0	14.3	48	24	16	14
2006	71.1	48.9	43.3	30	82.1	45	27.7	14.3	35	24	10	15
2005	67.8	47.8	50.4	15	88.4	29	20.2	16.2	61	38	19	18
2004	68.5	49.3	51.5	14	87.0	33	17.9	16.1	57	37	22	28
2003	70.1	48.7	46.9	27	84.7	25	32.2	13.5	33	23	13	15

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DRY SPELL							
2011	2010	2009	2008	2007	2006	2005	2004
60 DAYS	59 DAYS	83 DAYS	51 DAYS	31 DAYS	48 DAYS	37 DAYS	53 DAYS

AREA HIGHLIGHTS

OVERVIEW

It was another quiet fire season for the South Washington and North Oregon Cascades and foothills, except for a three-week period from late-August through mid-September. Average maximum and minimum temperature and humidity resembled 2010, with about an equal number of critical humidity days and nights. Despite the wet spring and early summer, the 2011 season ended with far fewer wetting rain days compared to 2010. There were 23 wetting rain days in 2010, but just 11 in 2011. The 60-day dry spell was just a day longer than last year, and close to the 8-year average. There were six lightning days, the same number as last year, but well below the 15-year average. Half of the lightning days occurred in late August. One lightning event around the 24th resulted in an outbreak of fire starts in the Mt. Hood N.F., one of which became a large, project fire.

Average ERC values lagged behind seasonal normal through early August, and peaked by September 10th. Substantial rainfall in May and June kept average ERC values at or below 10. At the end of July the average ERC value was close to 17, but jumped to 31 by the end of August. The highest 10-day average ERC, 41.2, occurred September 1-10, but was about 3 points lower than the 2010 ten-day maximum. Critical fuel conditions, defined as daily average ERC value of 45 or greater, occurred on 6 days, compared to 12 days in 2010. The highest daily average ERC was 55.2, and occurred on September 11th. The 100-hour fuel moisture content dipped below 10 percent on 7 days. Last year there were 12 such occurrences.

RAWS NOTES: 3-Corner Rock data started on July 12th. Elk Rock data commenced on May 19th. Locks humidity data was thrown out. Blue Ridge RAWS data was not used.

TEMPERATURE

The seasonal average of 68.3 was about 0.5 degrees warmer than 2010.

The warmest 10-day period: **September 1-10 (84.4 degrees).**

Number of days when the average high was 90 degrees or higher: **4**

Highest daily average high: **93.4 on September 11th.**
92.0 on September 10th.
91.7 on September 7th.

Highest temperatures: **Canyon Creek 102 on September 11th.**
Dry Creek 101 on September 11th.
Canyon Creek 100 on September 7th.
Dry Creek 99 on September 7th.

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Number of nights the average low was 65 degrees or greater: **0.**

Highest nightly average low: **64.4 on September 10th.**
62.9 on September 8th.
62.1 on September 7th.

Highest low temperatures: **Canyon Creek 72 on September 10th.**
3-Corner Rock 71 on September 10th.
Dry Creek 71 on September 10th.

Coldest low temperature: **Red Box 26 on May 1st.**
Buck Creek 27 on May 1st.
Wanderer's Peak 27 on May 1st.
Red Box 28 on May 4th.

HUMIDITY

There were 15 critical daytime humidity days during the season, compared to 13 in 2010. Critical daytime humidity was defined as at least six stations recording a minimum of 25 percent or less on any given day. There were 9 critical humidity nights this year, compared to 7 in 2010. The lowest 10-day average maximum was 64.4 September 1-10. This was 12 percent lower than the lowest 2010 average minimum humidity value. The lowest 10-day average minimum humidity was 24.1 percent September 1-10.

Lowest daily average minimum humidity: **17.7% on September 7th.**
18.1% on September 10th.
18.2% on September 11th.
18.3% on September 6th.

Lowest single-station minimum humidity: **Wanderer's Peak 8% on August 16th.**
Buck Creek 10% on August 17th and
September 10th.

Number of nights with recovery 55% or less: **4.**

Lowest nighttime average: **49.0% on September 7th.**
50.0% on September 10th.
50.7% on September 4th.
54.8% on September 6th.

Lowest single-station maximum RH: **Canyon Creek 31% on September 7th.**
Dry Creek 33% on Sept. 7th and 10th.
Log Creek 36% on Sept. 4th and 7th.

PRECIPITATION

Maximum 24-hour (daily) precipitation: **Log Creek 1.20 on September 27th.**
Horse Creek 1.16 on May 31st.
Dry Creek 1.10 on May 15th.
Elk Rock 1.08 on September 18th.

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FUELS

The 2011 season-average ERC of 17.4 was about 2.5 points lower than 2010, and was the lowest seasonal average since 2004. Average ERC values were at or below 10 through the end of June. ERC values continued a slow increase in early July, only to fall back to near 10 by July 20th. By the end of the 60-day dry spell, the average ERC had risen to around 45. The maximum 10-day average of 41.2 occurred during the period September 1-10, and was the only 10-day period with an average ERC above 40. Critical ERC values, 45 or greater, occurred on 6 days. The highest daily average, 55.2, occurred on September 11th. The average 100-hour fuel moisture content was 10 or less on 7 days, compared to 12 last year.

Critical ERC Days (45 or higher):	6.
Highest daily average ERC:	55.2 on September 11 th . 52.2 on September 9 th . 50.2 on September 12 th .
Highest single-station ERC:	Buck Creek 75 on Sept. 10 th and 11 th . Buck Creek 74 on September 13 th . Buck Creek 73 on Sept. 9 th and 12 th .
Number of days 100-hr FM was 10 or less:	7. 8 or less: 1.
Lowest daily 100-hr FM:	7.4 on September 11 th . 7.9 on September 9 th . 8.4 on September 7 th .
Lowest single-station value:	Dry Creek 5 on September 11 th . Dry Creek 6 on Sept. 8 th and 10 th . Buck Creek 6 on September 11 th . Canyon Creek 6 on September 11 th .
Highest daily 100-hr FM:	32.8 on October 12 th . 32.3 on October 7 th . 30.2 on October 6 th .

FAST FACTS: *Canyon Creek and Dry Creek RAWS were the only stations in the Portland Fire Weather forecast area to exceed 100 degrees.*

Three-Corner Rock is one of the windiest RAWS sites in the Portland Fire Weather area. Sustained 10-minute wind speeds of 20-30 mph are common during east-wind episodes. On September 29th Three-Corner Rock observed sustained wind speeds of 30-35 mph. The strongest wind speed was 35 mph at 0100 local time. The station with the highest sustained wind speed in zones 605, 607, and 660, other than Three-Corner Rock, was Eagle Creek. At 1200 local time on September 3rd Eagle Creek observed a wind speed of 15 mph.

One of the worst wind stations is Rye Mountain, in zone 602. The average reported wind speed during the period May 22 through October 10 was just 0.16 mph. The highest hourly wind speed at Rye Mountain was 5 mph, at 0700 local time September 3rd. There were 25 hourly observations during the fire season when Rye Mountain reported 3 mph or more.

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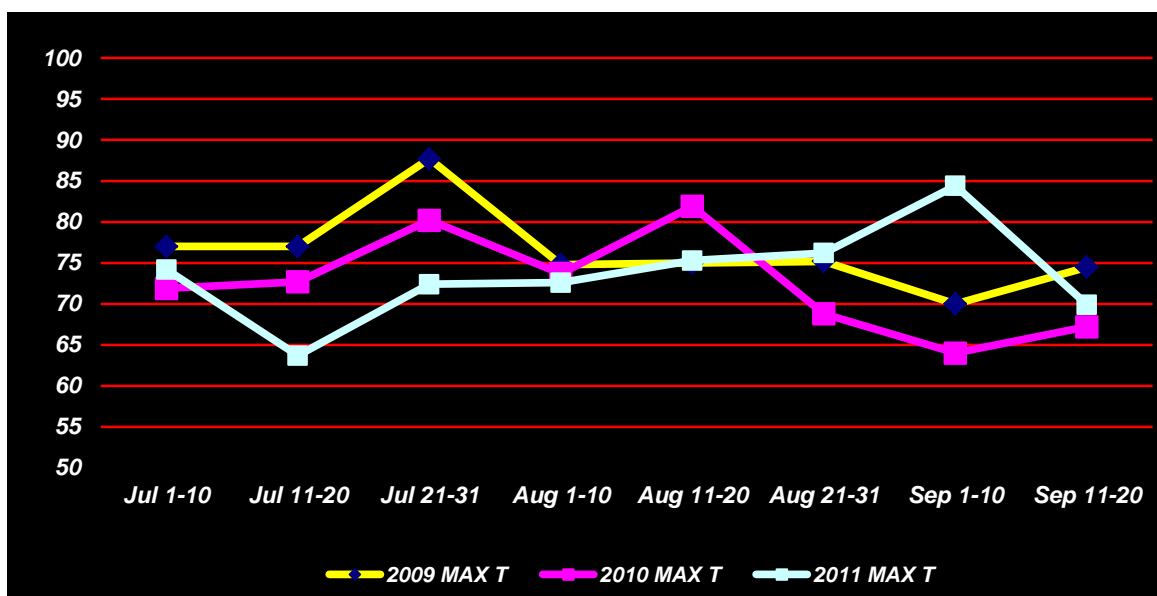


FIGURE 11 – 10-DAY AVERAGE MAX. TEMPERATURES ZONES 605, 607, AND 660

DOLLAR LAKE FIRE: The most critical period of the 2011 fire season occurred from late-August through about September 12th. A lightning episode on the 24th and 25th sparked hundreds of fire starts in the Mt. Hood and Willamette National Forests. Four of these became problematic fires, including the Dollar Lake Fire. It was detected around midnight August 27th, on the northeast flank of Mt. Hood. Inversions and slightly below-normal daytime temperatures September 1st and 2nd prevented the fire from making significant progress. However, a turn to critical fire weather was forecast to begin on the 3rd and continue through the afternoon of the 4th. Strong east wind on the 3rd pushed the west perimeter of the fire several miles to the west, dangerously close to Portland's Bull Run Watershed.

The fire grew to 3000 acres by late-afternoon September 3rd. There would be no immediate relief from the extreme fire weather pattern. Another round of dry and unstable conditions was expected from the 6th through at least the 11^h. Despite the Red Flag conditions, the fire did not exhibit the explosive behavior observed on the 3rd. Strong inversions around the fire area, primarily due to heavy smoke, limited fire growth. A return to cooler, onshore flow on the 12th provided firefighters the opportunity to improve existing lines, and concentrate efforts on the west perimeter. The west part of the fire received about a tenth to two-tenths of rainfall on the 17th. Between the 17th and 19th, rainfall amounts ranged from around an inch on the west side to one-half inch on the east side. A transfer of command from a Type I Incident Management Team (IMT), to a Type II IMT occurred on the 20th. Upon containment, the fire was around 6,300 acres, and was one of the largest fires to occur in the Mt. Hood National Forest.

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STATISTICS FOR AREA FOUR (CENTRAL CASCADES AND FOOTHILLS)

This area is comprised of zones 606 and 608. RAWs that represent the area include:

Boulder Creek, Yellowstone, Trout Creek, Brush Creek, Pebble, Fields, and Emigrant.

	TEMPERATURE		RELATIVE HUMIDITY				FUELS		PRECIPITATION			LTG
			4 OR MORE RAWs MEET CRITERIA FOR 2 HOURS						MEDIAN VALUES			
DATE	AVE MAX	AVE MIN	AVE MIN	DAYS <26%	AVE RECOVERY	NIGHTS <61%	ERC	100 HR	DAYS ≥ .01	DAYS ≥ .10	DAYS ≥ 0.25	DAYS
May 1-10	56.6	34.8	52.7	2	97.2	0	0.29	21.76	5	3	3	0
11- 20	57.7	36.2	53.2	0	98.3	0	0.12	23.27	7	3	2	0
21- 31	51.3	37.8	70.9	0	99.6	0	0.98	23.31	9	8	6	1
June 1-10	61.2	42.6	58.3	0	96.1	0	0.52	21.76	5	2	1	1
11-20	65.2	42.9	47.7	0	98.1	0	2.90	17.87	4	2	2	0
21-30	69.3	45.4	47.7	1	95.8	0	10.29	15.96	4	1	1	1
July 1-10	77.7	46.3	35.5	0	90.4	0	20.03	14.04	0	0	0	0
11-20	66.0	47.3	64.1	0	98.9	0	12.69	18.94	6	5	3	0
21-31	78.3	49.7	40.3	1	92.8	0	20.13	15.53	0	0	0	0
Aug 1-10	78.5	49.9	38.7	1	95.8	0	29.66	13.86	0	0	0	0
11-20	79.8	49.2	33.2	3	86.4	0	37.27	12.67	0	0	0	0
21-31	80.8	53.3	37.8	0	90.0	0	41.09	12.60	0	0	0	4
Sept 1-10	87.7	54.9	21.1	9	68.4	4	51.59	10.16	0	0	0	1
11-20	75.1	49.3	40.2	2	92.3	0	46.41	12.96	0	0	0	0
21-30	76.7	49.2	34.9	5	83.8	0	42.17	14.00	2	2	0	0
Oct 1-5	55.7	43.1	70.5	0	99.0	0	12.20	25.06	5	4	4	0
11-20												
AVE/TOT.	71.37	46.31	44.56	24	92.09	4	22.05	16.61	47	30	22	8
2010	70.72	46.40	45.99	15	92.29	5	25.02	16.22	45	31	21	15
2009	73.42	47.46	40.21	35	88.83	12	29.96	13.35	31	18	8	18
2008	73.0	48.1	42.6	28	85.0	42	26.87	13.85	40	22	11	10
2007	70.5	46.8	44.8	18	89.4	19	28.9	13.3	35	25	20	12
2006	73.9	48.6	39.6	37	82.0	42	29.4	13.5	33	25	16	17
2005	70.5	47.3	45.6	20	88.7	29	23.7	15.6	58	36	18	19
2004	71.8	49.0	45.6	19	86.5	30	23.3	14.8	43	26	20	24
2003	73.4	49.0	42.3	43	83.5	29	38.8	12.2	30	19	6	17

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DRY SPELL							
2011	2010	2009	2008	2007	2006	2005	2004
66 DAYS	45 DAYS	29 DAYS	51 DAYS	30 DAYS	89 DAYS	51 DAYS	73 DAYS

AREA HIGHLIGHTS

OVERVIEW

The 2011 season was wet through mid-July, and then dry through late-September. Temperature, humidity, fuels and precipitation were close to 2010 values. There were only four critical humidity nights, the fewest in at least the past eight years. In 2011, onshore low-level flow was dominant, especially from June through late-August, and there was a lack of surface thermal troughs. The low number of critical humidity nights may be attributed to the methodology used to determine humidity recovery of 60 percent or less. In the past, only the hours from midnight to 0700 were considered. In the past two years, the late-evening hours were also incorporated. Often, humidity on slopes and lower ridges will increase during the evening, before subsidence inversions become firmly established. Thus, the maximum RH is likely to occur before midnight.

Similar to the other inland regions, the most extreme portion of the fire season lasted from late-August through September. The average ERC value was at 20 or below through the end of July, which lagged behind the seasonal normal by 2-3 weeks. But, by August 20th, the average ERC had climbed to 37, and then reached a peak of 51.6 by September 10th. Some RAWS stations reached or exceeded record ERC values in early September. The average daily ERC value exceeded 50 on 13 days, compared to 9 last year.

The highest 10-day average high temperature was 87.7 September 1-10. Surprisingly, no RAWS station exceeded 100 degrees. The warmest daytime temperature was 97 at Trout Creek September 3rd. Numerous onshore flow events throughout the summer resulted in higher daytime humidity, but fewer thermal trough events. The area experienced two Red Flag events, separated by one day, during the first 10 days of September. A lightning episode around August 25th resulted in several fire starts. The Shadow Lake fire started in the Mt. Washington Wilderness area, on the Deschutes National Forest, but spread west to impact the Willamette National Forest. The fire was around 500 acres on September 2nd, but grew to 3,300 acres by the 6th and almost 10,000 acres by the 12th.

Unlike the other climate areas, fire weather zones 606 and 608 showed almost identical precipitation frequency compared to 2010. There were 22 wetting rain days, compared to 21 last year. Of the 22 wetting rain days, 15 occurred before July 1st. An unusual wet period in mid-July produced another three wetting rain days. The 2011 dry spell was 66 days, the longest since the 89-day dry spell of 2006. The dry spell started on July 20th and ended on September 24th.

This area tends to receive the most lightning in the forecast area. In 2011 there were only eight lightning days, about 50% of average. Four of those days were in late-August, during the most critical part of the fire season, and resulted in numerous fire starts. There were several instances when unstable south flow reached the north end of the Umpqua National Forest, but became more southwest in the southern Willamette district.

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TEMPERATURE

The seasonal average of 71.4 was 0.4 degrees warmer than 2010.

The warmest 10-day period: **September 1-10 (87.7 degrees).**

Number of days when the average high was 90 degrees or higher: **7.**

Highest daily average high: **93.4 on September 7th.**
92.7 on September 10th.
92.1 on September 11th.

Highest temperatures: **Trout Creek 97 on September 3rd.**
Emigrant 96 on August 20th.
Yellowstone 96 on September 7th and 9th.
Boulder Creek 96 on September 11th.

Number of nights the average low was 65 degrees or greater: **0.**

Highest average nightly low: **61.6 on September 7th.**
61.1 on September 10th.
60.4 on September 8th.

Highest low temperatures: **Yellowstone 71 on September 10th.**
Emigrant 69 on September 7th.
Yellowstone 69 on September 7th.
Emigrant 66 on September 10th.

Coldest low temperature: **Boulder Creek 21 on May 1st.**
Boulder Creek 25 on May 4th.
Pebble 26 on May 1st.

HUMIDITY

There were 24 critical daytime humidity days during the season, compared to 15 in 2010. Critical daytime humidity was defined as at least four stations recording a minimum of 25 percent or less on any given day. The lowest 10-day average minimum humidity was 21.1 percent September 1-10. The lowest 10-day humidity recovery period was 68.4 percent during the same period.

Lowest daily average minimum humidity: **13.1% on September 3rd.**
14.7% on September 10th.
16.7% on September 4th.
17.7% on September 11th.

Lowest single-station minimum humidity: **Boulder Creek 7% on September 2nd.**
Fields 7% on September 10th.
Boulder Creek 8% on September 3rd.

Number of nights with recovery 55% or less: **1.**

Lowest nighttime average: **52.1% on September 4th.**
57.1% on September 10th.
58.7% on September 7th.

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Lowest single-station maximum RH: *Emigrant 24% on September 10th.
Emigrant 29% on September 3rd.
Emigrant 34% on September 24th.
Yellowstone 36% on September 10th.*

PRECIPITATION

Maximum 24-hour (daily) precipitation: *Boulder Creek 1.41 on June 5th.
Trout Creek 1.28 on May 27th.
Fields 1.28 on July 19th.
Pebble 1.17 on May 27th.*

FUELS

The 2011 season-average ERC was 22.1 or about three points lower than the 2010 average. An abnormally wet May and June kept average ERC values at or below 10 through June. July started dry, allowing the average ERC to reach 20 by July 10th. A mid-July wet period put fuel conditions about 3 weeks behind schedule. The 3-week lag was eliminated by mid to late August. Average ERC values hit 40 around August 20th, and then 50 by September 1st. The average ERC remained above 40 through September. The 10-day average 100-hour fuel moisture content did not fall below 10 percent in 2011, but came quite close in early September. The average daily 100-hour fuel moisture content was 10 percent or less on 9 days, close to the 11 days in 2010, but a far cry from the 47 days in 2009.

Critical ERC Days (50 or higher): **13.**

Highest daily average ERC: *60.1 on September 11th.
58.4 on September 10th.
56.6 on September 9th.
56.0 on September 7th.*

Highest single-station ERC:
(Non-Emigrant) *Emigrant 77 on September 24th.
Yellowstone 67 on Sept. 10th and 11th.*

NOTE: Emigrant exceeded 70 on 12 days.

Number of days 100-hr FM was 10 or less: **9.** 8 or less: **2.**

Lowest daily 100-hr FM: *7.6 on September 11th.
8.3 on September 8th.
8.6 on September 10th.*

Lowest single-station value: *Emigrant 5 on September 11th.
Emigrant 6 September 7th through 10th.
Yellowstone 6 on September 11th.*

Highest daily 100-hr FM: **33.0 on June 2nd.
31.1 on May 31st, and June 1st.**

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CRITICAL FIRE WEATHER EVENTS

Critical Fire Weather conditions are those that **COULD** result in extreme fire behavior, or, in the case of problem or dry lightning, an abnormally high number of ignitions. One must be careful when assessing problem lightning. There are times when lightning activity does not meet Red Flag criteria (at least LAL 3 coverage), but does result in a high incidence of project fires.

The overall severity of any fire season is highly correlated with the extent and frequency of critical fire weather patterns during the season. It is not unusual to have an extended dry period during any given fire season. This in itself could result in an elevated degree of fire activity, provided the fuel conditions are right. However, to elevate a high fire danger situation to a critical or extreme level normally requires an additional weather element, or trigger, to be superimposed on the dryness. This additional trigger could be problem or dry lightning, an extremely unstable air mass, or a combination of strong wind and low humidity. Red Flag Warnings are issued when a combination of critical weather exists **WITH** sufficiently dry fuels and severe burning conditions. The Red Flag criteria for the Portland Fire Weather district are listed below:

CRITERIA FOR STRONG WIND AND LOW HUMIDITY (NIGHT)

ZONES 601 AND 602: Two stations must report 35% humidity or less **AND** 10-minute wind speed of 10 mph or more for 3 hours in an 8-hour block.

ZONES 603 AND 612: Rockhouse1 RAWs must report 35% humidity or less **AND** 10-minute wind speed of 15 mph or more for 4 hours in an 8-hour block **AND** one other RAWs must report 35% or less humidity **AND** 10-minute wind speed of 10 mph or more for 2 hours.

ZONE 604: Two stations (airports) must report 30% humidity or less **AND** 2-minute wind speed of 15 mph or more for at least 4 hours in an 8-hour block.

ZONES 605, 607, AND 660: One station must report 35% humidity or less **AND** 10-minute wind speed of 10 mph or more for 4 hours in an 8-hour block **AND** at least **TWO** other stations must report 35% or less humidity **AND** 10-minute wind speed of 10 mph or more for at least 2 hours.

ZONES 606 AND 608: One station must report 30% humidity or less **AND** 10-minute wind speed of 10 mph or more for at least 4 hours in an 8-hour block **AND** one other station must report the same for at least 1 hour.

CRITERIA FOR STRONG WIND AND LOW HUMIDITY (DAY)

At least 2 stations within a zone must report 25% humidity or less **AND** wind speed of 10 mph or more (except 15 mph in zone 604) for at least 4 hours in an 8-hour block.

CRITERIA FOR DRY AND UNSTABLE AIR MASS (HAINES 6)

At least **ONE** station within a zone must report 25% humidity or less **AND** show a high-level Haines value of 6 **AND** fuel conditions (Dryness Levels) are in the "BROWN". At forecaster discretion, can also be issued when Dryness Levels are "YELLOW".

PROBLEM LIGHTNING

Dryness Levels **MUST** be in the "BROWN" and expected lightning frequency is such that multiple starts (about 5-7) are expected. Typically scattered or LAL 3 coverage. At forecaster discretion, can also be issued when Dryness Levels are "YELLOW".

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There were three critical fire weather events during the 2011 fire season. However, the August 24-25 lightning event went unwarned. The first warned Red Flag Warning event, September 3-4, was for dry and unstable, or Haines 6, conditions. The second Red Flag Warning event covered several days, and included critical fire weather parameters such as Haines 6 conditions, problematic lightning, and low humidity.

1. SEPTEMBER 3-4, 2011 DRY AND UNSTABLE AIR MASS AND CRITICAL FUELS

The 2011 fire season took an abrupt turn from benign conditions to extremely critical conditions in late August and early September. The August 24-25 lightning outbreak resulted in hundreds of fire starts across the Portland fire weather district, a few of which became large fires. On September 3rd, an offshore fire weather pattern was beginning to take shape. Figure 12 below, shows the surface pattern at 0500 PDT on September 3rd. Note the thermally-induced surface low, or thermal trough, developing along the coast.

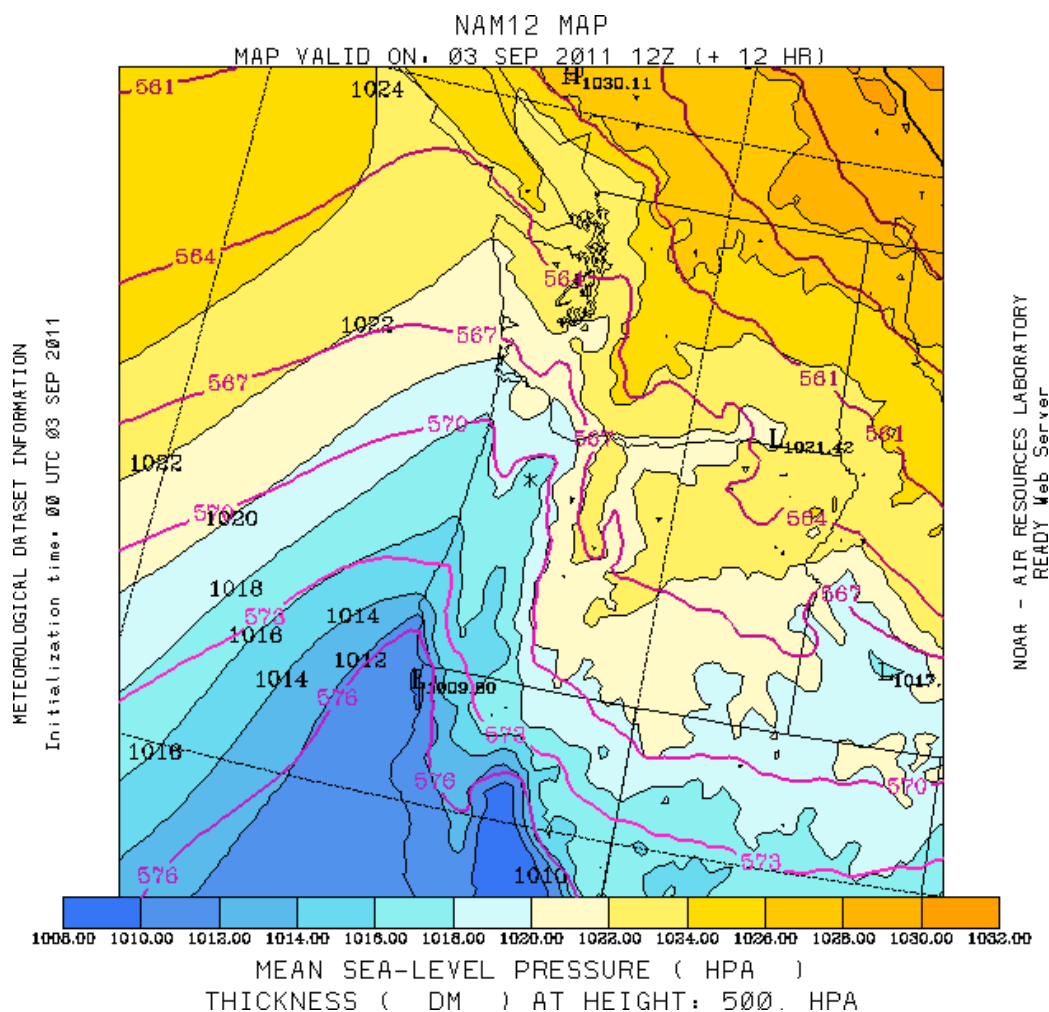


FIGURE 12 – SURFACE PATTERN 0500 PDT SEPTEMBER 3, 2011

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By 1700 PDT on the 3rd, the thermally-induced surface low had migrated to near the Coast Range (see figure 13 below). Gusty east wind developed in zone 605 early in the morning on the 3rd and continued throughout the day. Horse Creek RAWS reached Red Flag Criteria at 0500 PDT with a sustained wind speed of 11 mph and humidity of 32%. Eagle Creek RAWS observed east wind of 14 mph and a humidity of 18% at 1000 PDT. Log Creek RAWS, in zone 607, reached Red Flag criteria by 0600 PDT. Three-Corner Rock, one of the most east-wind prone RAWS stations in the South Washington Cascades, zone 660, observed sustained 10-minute wind speeds of 20-25 mph as early as 0300 PDT. The wind increased to 25-30 mph by 0700 PDT.

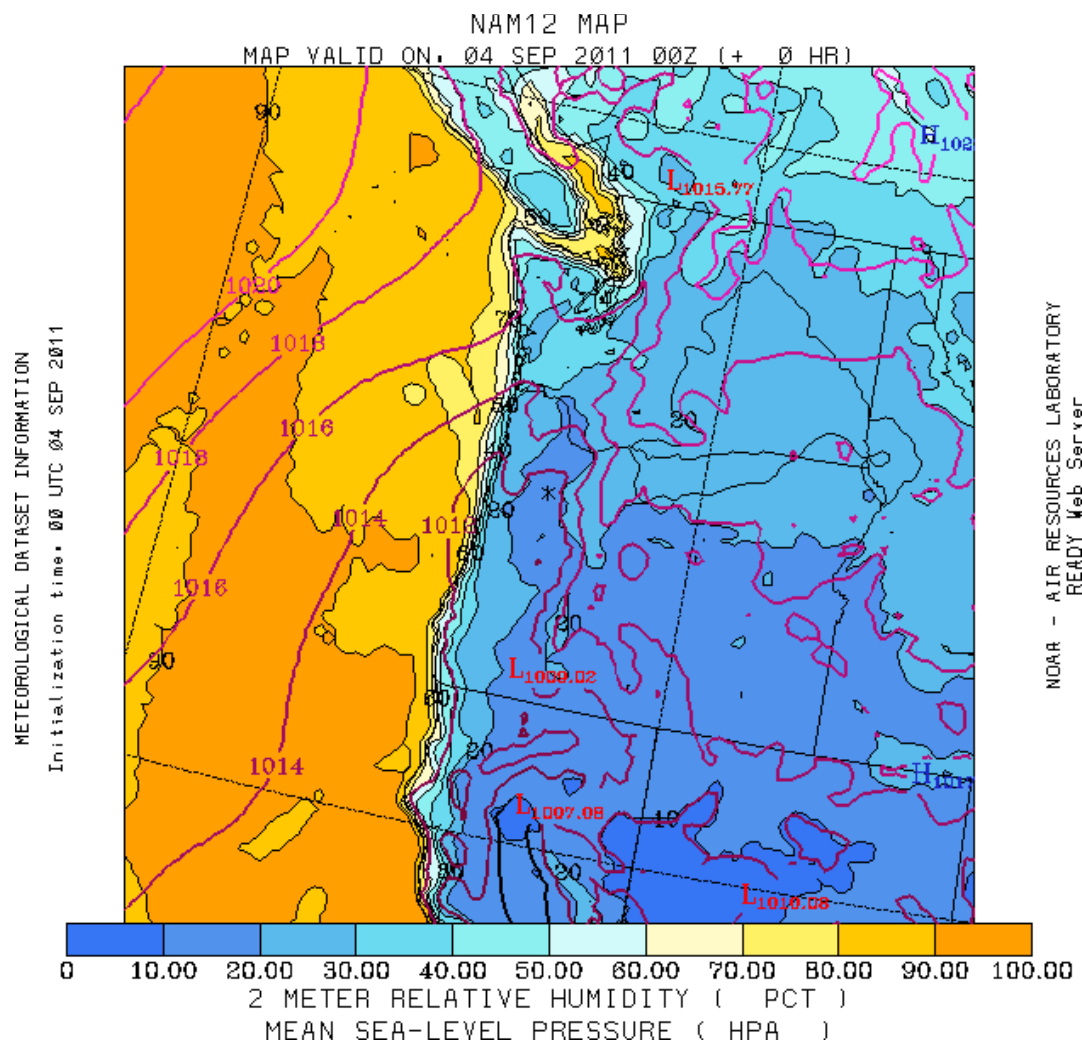


FIGURE 13 – SEA-LEVEL PRESSURE AND 2 METER RH 1700 PDT, SEPTEMBER 3, 2011

Also note the widespread humidity of 20 percent or less across the Willamette Valley, and the Cascades and foothills. This was a relatively short-lived event. The thermally-induced surface low had moved to the east slopes of the Cascades by 1100 PDT on the 4th. Model soundings for Portland and Roseburg indicated mid-level Haines 6 conditions at 0500 PDT on the 4th. Station ERC values on the 4th included 68 at Emigrant (zone 608), 54 at Dry Creek (zone 660), 52 at Fields (zone 608), and 46 at Eagle Creek (zone 605), all of which were above the 90th percentile.

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WARNING CHRONOLOGY: A Fire Weather Watch was issued at 1458 PDT on September 2nd, covering zones 607, 608, and 660. The Watch was valid from the evening of the 3rd through the afternoon of the 4th. At 0906 PDT on the 3rd, the Watch was upgraded to a Warning, and was valid from 1800 PDT on the 3rd through 1800 PDT on the 4th. An update was issued at 1110 PDT on the 3rd to add zone 605 to the Warning for wind and low humidity concerns, valid through 2000 PDT. Red Flag conditions were already occurring when this update was issued. The last statement for this event was issued at 1428 PDT on the 4th, letting the warning expire at 1800 PDT, as scheduled.

VERIFICATION: Dry and unstable, or Haines 6, conditions are difficult to verify due to the lack of upper air data. Model soundings can be used to help verify Haines 6 conditions, but are not absolute. In this case, model soundings at Portland and Roseburg indicated mid-level Haines 6 conditions at 0500 PDT of the 4th. A surface analysis showed the thermally-induced surface low over the Cascades and foothills at 0500 of the 4th. Thus, the start time of the event was deemed to be 0500 on the 4th.

The wind/RH portion of the warning verified as early as 0500 of the 3rd. The warning was issued after Red Flag conditions developed. The average Watch lead time was 38 hours. The average Warning lead time, for zones 607, 608, and 660 was just under 20 hours.

2. SEPTEMBER 6-11, 2011 DRY AND UNSTABLE, CONDITIONS, PROBLEMATIC LIGHTNING, LOW HUMIDITY, AND CRITICALLY DRY FUELS

The final Red Flag event for the 2011 season covered several days and included a myriad of fire weather concerns. Normally, Red Flag Warnings cover 24-48 hours, but this event was almost five days. After the offshore event of the 3rd and 4th, there was a brief return to onshore low-level flow. An upper level trough moved across Southern Oregon and Northern California the afternoon of the 5th. By the morning of 6th high pressure was already expanding north into Oregon, Idaho, and Southeast Washington. Figure 14 on the next page shows the 500 mb pattern at 1700 PDT on the 6th. Observed ERC values on the 6th included 70 at Emigrant (zone 608), 69 at Buck Creek (zone 660), 55 at Fields (zone 608), and 50 at Canyon Creek (zone 660). Most of these values represented 97th percentile or greater values. There were several large on-going fires at this time, including Dollar Lake, Shadow Lake, Substitute, and Mother Lode, just to name a few.

Model graphics valid 0500 PDT on the 7th indicated a thermally-induced surface low extending from the south Oregon Coast, across the Central Coast Range, into the North Oregon Cascade foothills. By 1100 PDT this feature had drifted to the Cascades. Significant growth was observed on the Mother Lode Fire September 7th. The upper ridge shifted east on the 7th, and by 1700 PDT a weak upper low was taking shape off the North California Coast. At 2300 PDT, the upper low had drifted into Northwest California, with moist, unstable south flow aloft spreading into Southwest and South-Central Oregon. Lightning was noted in the south half of the Willamette NF.

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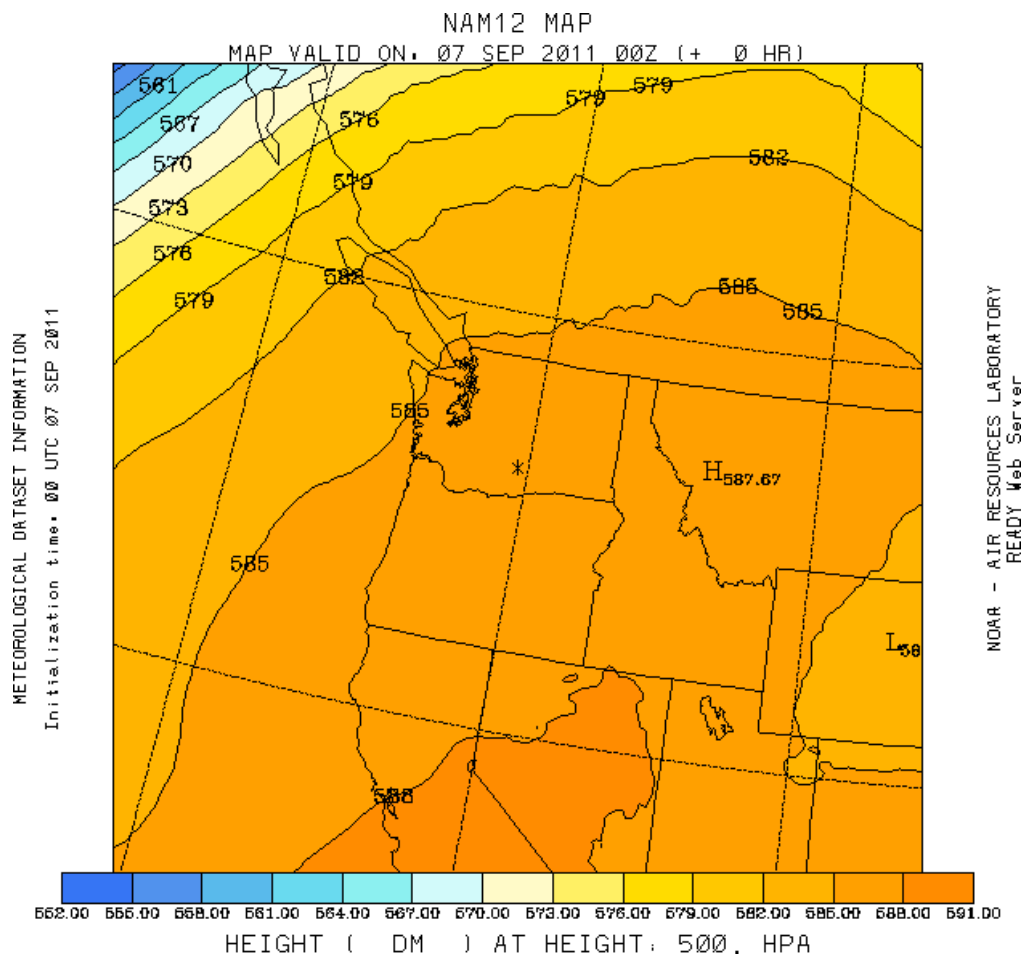


FIGURE 14 – 500 MB PATTERN 1700 PDT SEPTEMBER 6, 2011

After the first thermal trough passage, and subsequent lightning threat, another thermally-induced surface low started to develop on the 10th. A Red Flag warning was issued the morning of the 9th for the Coast Range zones, due to the extreme fuel conditions and potential thermal trough passage. Station ERC values on the 9th included 56 at Village Creek, 51 at South Fork, 50 at High Point and 47 at Miller, all of which were well above the 90th percentile.

At 1700 PDT on the 10th, the thermal trough remained entrenched over the Willamette Valley and Cascade foothills, with another branch in the Columbia River Gorge. Overall weather conditions remained nearly status quo on the 11th. Fuel conditions in the Cascades reached the most critical levels of the season. The highest daily average ERC value for all the Cascade zones occurred on the 11th. The average ERC for zones 606 and 608 was 60, up from 58 the day before. The average ERC for zones 605, 607, and 660 on the 11th was 55. The Coast Range zones were not far behind with an average ERC of 51. The persistent thermal trough pattern finally showed signs of breaking down by the evening of the 11th. At 2300 PDT on the 11th, the heart of the thermal trough had relocated to the Columbia Basin and the east slopes of the Cascades. The event came to an end at 0600 PDT of the 12th.

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WARNING CHRONOLOGY: A Fire Weather Watch was issued at 1443 PDT September 5th, and was valid from late-night of the 6th through the evening of the 8th. The watch covered zones 605, 606, 607, 608, and 660. The Watch was upgraded to a Red Flag Warning at 0846 PDT on the 6th, and was valid from midnight of the 7th through midnight of the 9th. The warning did not include lightning in zone 660. At 1402 PDT on the 7th the warning was extended through 0600 PDT of the 12th. A Fire Weather Watch was issued for zones 602, and 603, valid from the afternoon of the 9th through the evening of the 10th. At 0745 PDT of the 9th the Coast Range watch was upgraded to a warning. In addition, zone 604 was added to the warning. At 1457 PDT of the 11th, the warning was cancelled for zones 602, 603, and 604. The final expiration statement was issued at 0555 PDT on the 12th.

VERIFICATION: Model soundings were used to help verify the Haines 6 part of the warning. Model output for Roseburg valid at 1100 PDT on September 7th indicated mid-level Haines 6 conditions. The same model valid at 1400 PDT on the 7th for Salem showed mid-level Haines 6 conditions as well. A surface analysis at 1400 PDT revealed the thermally-induced surface low residing over the Cascade foothills. One last verifying tidbit was the significant growth on the Mother Lode Fire.

Wind and low humidity was a relatively short-lived portion of the multi-day warning. Log Creek RAWS, zone 607, recorded humidity of 25% or less and wind gusts of 20-27 mph beginning 1100 PDT on the 7th. Larch Mountain RAWS exhibited the same conditions beginning at noon followed by a thermal trough passage around 1800 PDT. Locks RAWS, in the Columbia Gorge, registered gusts to 20-25 mph beginning at 1400 PDT, but the wind died off by 1900 PDT. Yellowstone and Emigrant RAWS, in zones 606 and 608 respectively, had a wind shift from offshore to onshore during the mid to late-afternoon hours of the 7th.

Model soundings valid 1400 PDT on the 9th revealed mid-level Haines 6 conditions in the Coast Range, Willapa Hills, and Willamette Valley. According to reports submitted via InciWeb, the Dollar Lake fire, in the Mt. Hood NF, burned actively the night of the 10th through the 11th. The most active parts of the fire burned as a crown fire, carried by lichens and moss. Extreme fire behavior was expected on the 11th. Subsidence inversions and proximity to the thermally-induced surface low played a major role in the unpredictable activity on the Dollar Lake Fire.



FIGURE 15 – NATIONAL WEATHER SERVICE AND FIRE WEATHER LOGO

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FORECASTS AND SERVICES

SPOT FORECASTS

Spot forecast requests nearly doubled in 2011, compared to last year. Despite a quiet wildfire season, the Portland office received 221 spot forecast requests, which was well above the 120 spots last year. There were 93 wildfire spot forecast requests, which was well above the 51 from last year. Over 80 percent of the wildfire spots occurred in September, many of which were for the Dollar Lake, Mother Lode, and Shadow Lake wildfires. There were 77 wildfire spot requests in September. Prescribed burning activities were nearly non-existent in the spring and early summer due to the abundant late-season snowpack and wet conditions in May and June. However, prescribed burning opportunities were much more abundant in the late-summer and fall. Of the 113 prescribed burn spot requests, 80 occurred during September through mid-November. In fact, there were 13 prescribed spot request in November, far more than any year since 2003. Eugene BLM, US Fish and Wildlife, and the Barlow district of the Mt. Hood NF were quite active in prescribed burning during the fall.

The use of spot forecasts continued to become more diverse. There were a handful of requests for search-and-rescue missions, training exercises by local fire departments, public safety, and HAZMAT. Eugene BLM also submitted 3 spot requests for their annual early-spring spray activities. Figures 17 and 19, on pages 51 and 53, respectively, show the 2011 spot breakdown by month and the annual spot summary since 1992.

The Willamette National Forest has always been one of the primary users of the spot forecast program, and 2011 was no exception. They accounted for 61 of the 221 spot forecast requests. The Mt. Hood National Forest was much more involved this year, mainly due to the Dollar Lake Fire, and the increased demand from the Barlow District. The Mt. Hood NF had 78 spot requests, compared to 15 in 2010. There were 49 wildfire spot requests and 29 prescribed burn requests from the Mt. Hood, respectively. The US Forest Service accounted for nearly two-thirds of all spot requests. The US Fish and Wildlife Service continued to utilize the spot program for its prescribed burn activities. The USFWS submitted 24 requests, which was about the same as last year. Other agencies that were prominent in the spot forecast program included the Washington Department of Natural Resources (DNR), Oregon Department of Forestry (ODF), and the BLM. City and local agencies, like Portland Fire and Tualatin Valley Fire and Rescue and county sheriff offices had a few requests. Even county emergency management had a few requests. Surprisingly, the Gifford Pinchot NF had a total of just four spot requests, three for prescribed burns and one for wildfire.

The most active spot months, by far, were September and October, with a total of 159 spot requests. Normally, July and August see a substantial increase in wildfire spot activity, but that was not the case this year. There were 9 spot requests in July, none for wildfire. In August there were 19 spot requests, down from the 26 last year.

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INTERESTING SPOT FORECAST TIDBITS FOR 2011

- ☛ The **FIRST** spot request for 2011 occurred February 2nd. The Columbia Gorge Scenic Area made a request for the Collins Slide prescribed burn, on the Washington side of the Columbia River. The **LAST** spot request for the season was November 17th, submitted by the Eugene BLM for the Trivial Tempest prescribed burn.
- ☛ The **FIRST** wildfire spot was issued August 16th, requested by the Clackamas District of the Mt. Hood NF, for the Goat Mountain Fire. The **LAST** wildfire spot forecast was issued October 1st, by the Barlow Ranger District of the Mt. Hood NF for the Dollar Lake Fire.
- ☛ The most spot forecasts in one day: 7 on October 18th. There were 3 days with 6 spots: September 9th, September 28th, and October 19th.
- ☛ There were 146 spot requests from the Forest Service (USFS), or 66 percent of the seasonal total. The BLM made 23 requests, compared to 20 last year. Twenty BLM requests for prescribed burn activities and the other three were for a spray project. Oregon Department of Forestry submitted five requests, three for wildfires, one for prescribed burning, and another for a training exercise. The US Fish and Wildlife Service had 24 spot requests.
- ☛ The 146 USFS spot requests were divided amongst the forests as follows: 78 for the Mt. Hood, 61 for the Willamette, 4 for the Gifford Pinchot, and 3 for the Siuslaw.
- ☛ The Eugene BLM district had 21 spots, while the Salem district submitted two. All BLM spot requests were for prescribed burn or spray activities. The BLM conducted two spray projects. The Salem district had the Horning Seed Orchard spray project at the end of March and April. The Eugene district conducted the Tyrell Seed Orchard operation in mid-April.
- ☛ September was the busiest spot month since at least 2003. There were 105 spot requests, a number that has exceeded yearly totals on many occasions. Of the 105 September requests, 77 were for wildfires. October was an active prescribed-burn month, with 40 project requests. There were two large fires (100 acres or at least Type II management level) in the Portland forecast area. Dollar Lake Fire, primarily in the Barlow District of the Mt. Hood NF, and the Shadow Lake Fire, mostly in the McKenzie District of the Willamette NF. Several spot forecasts were provided for a couple Type III incidents. The Mother Lode fire in the Estacada District of the Mt. Hood had numerous spot forecasts from early September through the end of September, and the Substitute Fire in the McKenzie

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District of the Willamette NF. A couple other fires of note included the Zog Creek Fire which burned in the Middle Fork District of the Willamette, and the Nasty Fire, in the Clackamas District of the Mt. Hood NF.

TURN-AROUND TIME

“Turn-Around Time” has been documented since the 2000 season. It is defined as the elapsed time between spot request receipt, or notification, and forecast transmission. The Web-based spot program makes this element very easy to monitor. The usual complications for prescribed burns still exist. Quite often, the user-agency will submit a spot request the day before actual ignition. Obviously, turn-around time is not applicable in these cases. The precedent for the Portland office is to disregard turn-around time for requests submitted in advance of the actual burn time.

A past agreement between the former Pacific Northwest Wildfire Coordinating Group (PNWCG) and Western Region of the National Weather Service (NWS) stated that required turn-around times were to be no more than 45 minutes for wildfire spot requests and 60 minutes for prescribed burns, unless prior arrangements have been made. The 2011 turn-around times were 34.22 minutes for prescribed burns, 34.40 minutes for wildfires, and 33.09 minutes for all other forecast requests. The 2011 times were quite close to those in 2010. Forecasters were able to shave about four minutes off the wildfire spot turn-around time. There are rare occasions when the Portland office may not have a qualified spot forecaster on duty when a spot request is received. In these cases, a certified spot forecaster must be called back to the office. At the end of the 2011 season the Portland office had 10 qualified spot forecasters and one other in training status. The likelihood of having to call in someone to handle a spot request is much lower than previous years.

The web-based spot program provides a quick and easy means for users to request spot forecasts. There were a few occasions when the completed spot forecast suffered delays upon transmission. There has been infrequent software glitches that result in delayed spot request receipt by the forecast office, or delayed spot forecast transmission to the user.

There were two instances when the applicable turn-around time exceeded 100 minutes. The first occurred July 4th, for a prescribed burn in the Sweet Home District of the Willamette NF. The spot request was submitted at 1420 PDT on July 4th, but the planned ignition time was 1200 PDT on the 5th. The 108-minute turn-around time was somewhat misleading because forecast receipt by the user was not urgent. The forecaster chose to complete the afternoon Fire Weather Planning Forecast before handling the spot request. The other occasion took place September 6th. A spot request was sent at 1627 PDT for the Mother Lode Fire. The fire forecaster had left for the day at 1600 PDT. A spot-qualified forecaster was not available. Thus, a call-back to a qualified spot forecaster was in order.

There was a sense of urgency because the spot request was for an ongoing wildfire in the midst of a Red Flag event. The resultant turn-around time for this wildfire spot forecast was 149 minutes. The Annual Operating Plan (AOP) states that prescribed burn requests **SHOULD** be

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received by 1200 on any given day. Typical spot turn-around times were on the order of 20 to 30 minutes.



Figure 16 – Portable Fire RAWS

FIGURE 17 – 2011 SPOT FORECASTS (BY MONTH)

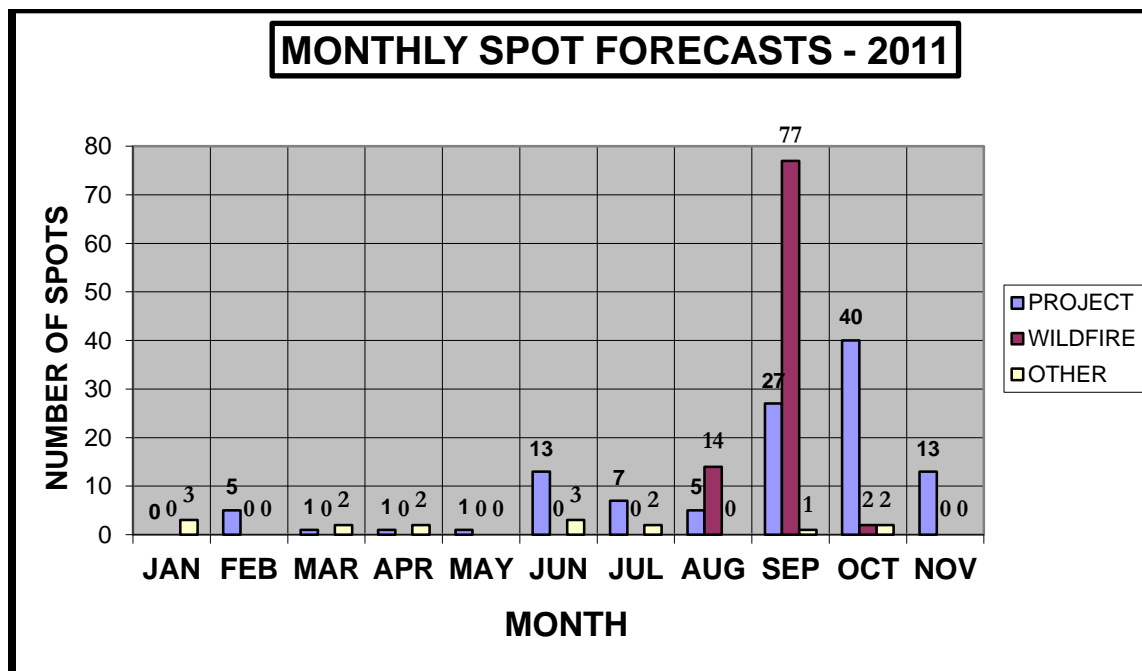


Table 8 (next page) shows the annual spot forecast data from 1994 to 2011. The spot frequency showed a dramatic increase from 2000 to 2003, but due to the change in forecast area responsibility and agency requirements for prescribed burns, 2004 spot totals were much lower. Also, some units/districts curtailed prescribed burn activities starting in 2004 due to budget constraints, staffing concerns, or a number of other reasons. However, note the substantial increase in prescribed burn spots this year.

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Seasonal spot totals exhibited a consistent trend from 2008 to 2010, with an average of about 125 spots per season. The 2011 spot season started quite slowly, with only 15 spot requests through May 31. Nearly half of those were non-fire related, such as public safety, search and rescue and orchard sprays. The abnormally wet May and June this year severely curtailed prescribed burn projects, but many agencies took advantage of the dry September and October to do pile-burning. The 93 wildfire spots were the highest since 2006, when there were 96 requests. The total of 221 spot requests was the most since 2003, the last year the Portland office had responsibility for east-side zones 609, 610, and 611.



Figure 18 – Dollar Lake Fire September 3rd, 2011

TABLE 8 – ANNUAL SPOT FORECAST DATA

YEAR	PROJECT*	WILDFIRE	TOTAL
1994	44	21	65
1995	104	15	119
1996	64	51	115
1997	58	9	67
1998	52	31	83
1999	58	54	112
2000	89	20	109
2001	125	70	195
2002	123	147	270
2003	117	132	249
2004	71	21	92
2005	55	29	84
2006	120	96	216
2007	70	25	95
2008	61	73	134
2009	57	58	115
2010	69	51	120
2011	128	93	221

** = INCLUDES TRAINING SPOTS, SEARCH AND RESCUE, AND OTHER MISC. REQUESTS.*

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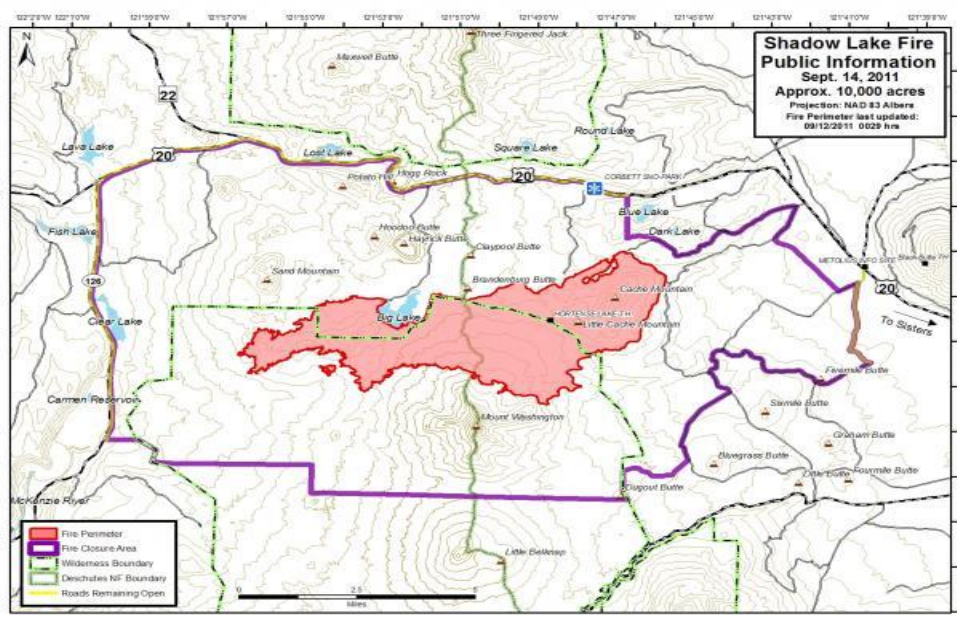
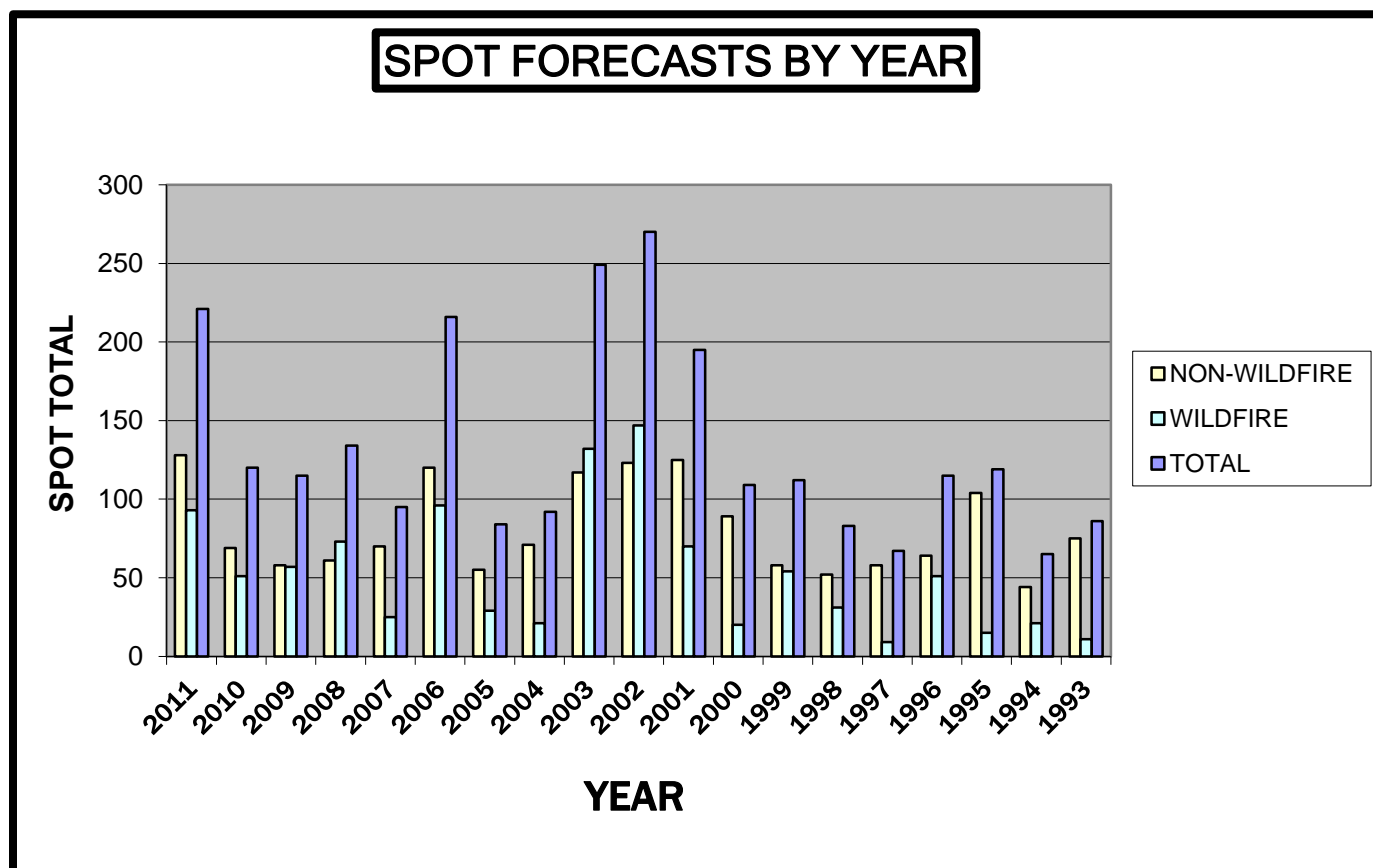


Figure 19 – Shadow Lake Public Information Map

Figure 20 below shows the yearly spot breakdown from 1993 to 2011

FIGURE 20 – ANNUAL SPOT FORECAST TOTALS



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FORECAST SERVICES

The fire weather desk was staffed from March 28th, 2011 through October 28th, 2011. Full-time fire weather operations (7 days a week) commenced on May 29th, 2011, during the Memorial Day holiday weekend, and ended on October 8th, 2011, about the same time as last year. Internet weather briefings started on June 13th, 2011. Internet briefing participation was down through mid-August, due to the slow start-up of peak fire season. The number of users generally averaged 4-7 through mid-August, but jumped to 7-12 by the end of August. In late-August and early September 15-20 briefing participants was common. Eugene Dispatch, Mt. Hood N.F., Gifford Pinchot N.F., several ODF units, and the north and south zones of Willamette N.F. were primary participants. Daily internet briefings ended on October 6th, and then went to a Tuesday/Thursday schedule October 6th through October 28th. The Portland office also participated in daily coordination calls set up by the Northwest Coordination Center. These calls started on August 8th and ended September 26th. The Portland office also supplied one person to the Coordination Center from March through the end of October. The office continued to have two Type I IMETs, and added a Type II IMET late in the season.

NFDRS forecasts started on April 15th and ended on October 20th. This was the third year of doing an all-points forecast. Verification statistics are based on persistence forecasts. This year verification was determined using two systems. The standard program, which originated from Boise, was compared to an in-house version. Both methods provided similar results, even though the in-house database initialized on June 1st, or about six weeks after the Boise database.

The baseline statistic is forecaster improvement over persistence. The old Memorandum of Understanding (MOU), which expired in 2005, included verification performance standards. These standards included 35 percent improvement for temperature, 25 percent improvement for humidity, and 10 percent improvement for wind, and then a 5 percent increase each year thereafter. The current expectations are less rigid than the expired MOU. The Portland office experienced about a one percent decrease in temperature performance, 37.4 percent improvement over persistence this year compared to 38.5 percent in 2010. The 2011 humidity score was four percent higher, 32.2 percent this year to 28.1 percent in 2010. The Portland office continues to show substantial improvement in wind scores. The 2009 wind score was 4.0 percent, and was the highest since at least 2000. The 2010 score of 5.5 percent set a new office record. However, it was a short-lived record. The 2011 wind verification score was 7.5 percent, nearly 40 percent better than the previous year.

April through July were exceptional months for NFDRS forecasting. The temperature scores were 40 to 55 percent, and wind scores 9 to 12 percent. Numerous big-change days in May and June contributed to the gaudy numbers. NFDRS forecasting became much more difficult in August due to long-term persistence patterns. The August humidity score was a modest 13.0 percent. There were 3105 individual NFDRS forecasts in 2011, which was slightly higher than the 2010 total of 3065.

Another poor wind station is Wilkinson, in zone 603. The highest observed hourly wind speed was 5 mph. The seasonal average wind speed was 1.14 mph.

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TRAINING AND EDUCATIONAL OUTREACH ACTIVITIES

Portland continued to be heavily involved in teaching and training activities. Table 9 shows all of the outreach activities from fall 2010 through fall of 2011. The Portland office has several people involved in training and outreach activities. The S-190 through S-590 series has undergone major revisions in the past few years. PowerPoint presentations have been developed, replacing the slides and overhead projection graphics. Portland continues to have some responsibility for teaching and training services for zones 609, 610, and 611, although Pendleton is the primary resource.

The Portland office is unique in that a National Weather Service fire weather meteorologist is detailed at the Northwest Coordination Center from March through October. This creates an improving working relationship between Predictive Services and the National Weather Service. It also provides many additional outreach opportunities. However, 2011 was the last season with this arrangement.

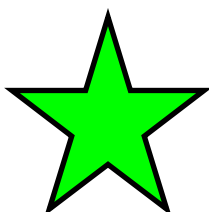


TABLE 9 – TRAINING AND EDUCATIONAL OUTREACH ACTIVITIES

DATES	ACTIVITY	AGENCY/USER	INSTRUCTOR
November 1-2, 2010	S-290 REDMOND, OR	COCC	RUTHFORD
January 10-12, 2011	S-390 REDMOND, OR	COCC	WEISHAAR
February 8, 2011	S-190 CLACKAMAS FIRE DIST. #1	COUNTY FIRE	WEISHAAR
February 20, 2011	S-190 PORTLAND CC	PCC	WEAGLE
February 22-23, 2011	WILLAMETTE FMO MEETING	USFS/BLM/ODF	RUTHFORD
March 2-3, 2011	S-290 TUALATIN, OR	TVFR	WEISHAAR
March 16-18, 2011	NWCC MEETING SEATTLE, WA	AIRFIRE	RUTHFORD

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DATES	ACTIVITY	AGENCY/USER	INSTRUCTOR
March 20-25, 2011	IMET WORKSHOP	NWS	RUTHFORD/WEISHAAR
April 2, 2011	S-190 PORTLAND CC	PCC	WEISHAAR
April 5-7, 2011	SCIENCE OF OIL SPILLS	NOAA ORR	RUTHFORD
April 11-15, 2011	S-490 REDMOND, OR	REDMOND TRAINING CENTER	RUTHFORD
April 16-17, 2011	S-290 JUNCTION CITY, OR	BLM/USFS	WEISHAAR
April 19-20, 2011	S-290 COWLITZ FIRE AND RESCUE	LOCAL FD	WEAGLE
April 18-22, 2011	S-495 TUSCON	VARIOUS	RUTHFORD
April 25, 2011	S-390 SPRINGFIELD, OR	ODF/USFS/BLM	WEISHAAR
April 25, 2011	S-390 SANDY, OR	USFS MT. HOOD NF	RUTHFORD
April 28-May 1, 2011	S-290 CLACK. COMM. COLLEGE	CCC	ROCKEY
May 10, 2011	S-390 CLACK. COMM. COLLEGE	CCC	WEISHAAR
May 10, 2011	S-190 RIPPLEBROOK	USFS MT. HOOD	RUTHFORD
May 13-14, 2011	PNW WX WORKSHOP	VARIOUS	RUTHFORD
May 16, 2011	SEATTLE, WA WFO PQR FIRE WX MEETING	NWS/NWCC	RUTHFORD/WEISHAAR
May 17, 2011	WX REFRESHER ZIGZAG, OR	ZIGZAG IHC	WEAGLE
May 24-25, 2011	OIL SPILL CONFERENCE	NOAA	WEISHAAR/RUTHFORD
June 7, 2011	FIRE SIMULATION EXERCISE	VARIOUS	WEISHAAR
June 10, 2011	EUGENE, OR WX REFRESHER HOOD RIVER, OR	COL. GORGE NSA	WEISHAAR

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DATES	ACTIVITY	AGENCY/USER	INSTRUCTOR
June 14, 2011	S-190 CAMP BALDWIN	USFS	WEISHAAR
June 22-23, 2011	S-290 TILLAMOOK, OR	ODF	WEAGLE
Nov 15-16, 2011	S-290 HOOD RIVER, OR	COL. GORGE NSA	WEISHAAR

LARGE FIRES AND IMET DISPATCHES

The 2011 fire season was rather quiet, similar to the 2009 and 2010 seasons, in terms of large fires. There were three large fires in the Portland Forecast area, shown below in Table 10.

TABLE 10 – MAJOR FIRES

FIRE NAME	AGENCY	SIZE	START DATE	CONTAIN DATE	CAUSE
Dollar Lake Fire	USFS Mt. Hood	6,304	August 27, 2011	October 15, 2011	Lightning
Shadow Lake Complex	USFS Deschutes and Willamette	10,000	August 28, 2011	October 1, 2011	Lightning
Mother Lode Fire	USFS Mt. Hood	2,717	August 26, 2011	September 30, 2011	Lightning

The Portland office fulfilled several spot forecasts for the Nasty Fire, in the Clackamas District of the Mt. Hood NF, and the Substitute Fire, in the McKenzie District of the Willamette NF. The 88-acre Substitute Fire required a Type III Incident Management Team. The Portland office continued to have two qualified Type I IMET's in 2011. In addition, a Type II IMET achieved certification near the end of the fire season. One of the Type I IMETs spent considerable amount of time detailed at the Northwest Coordination Center to provide support for decision-making and resource allocation. This position will no longer exist in 2012.

The Portland office filled **FOUR** IMET requests.

1. OSHA AND WALLOW FIRES (18 DAYS)

IMET: JULIA RUTHFORD
 DATES: June 2nd through June 20th
 LOCATION: OSHA FIRE: Near Sipapu Ski Area
 WALLOW FIRE: Near McNary, AZ
 ICP OSHA: Penasco, NM
 ICP WALLOW: Horseshoe Cineaga
 IMT: OSHA FIRE: Central Arizona Type II
 IC – Clay Templin

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WALLOW FIRE: Southwest Type I
IC- Dugger Hughes

CAUSE:

2. SHADOW LAKE FIRE (14 DAYS)

IMET: JULIA RUTHFORD
DATES: September 3rd through the 18th
LOCATION: Deschutes and Willamette NF 15 miles West of Sisters, OR
ICP -
IMT: Portland NIMO
IC- Gage and Bennett
CAUSE: Lightning

3. DOLLAR LAKE FIRE (3 DAYS)

IMET: SCOTT WEISHAAR
DATES: September 23rd through September 26th
LOCATION: Mt. Hood Wilderness
ICP – Hood River County Fairgrounds Odell, OR
IMT: Pacific Northwest Type II
IC – Carl West
CAUSE: Lightning

4. SE TEXAS COMPLEX (7 DAYS)

IMET: SCOTT WEISHAAR
DATES: October 21st through October 28th
LOCATION: Eastern Texas
ICP – Texas Forest Service Lufkin, TX
IMT: Southern Area Type II
IC – Mike Dueitt
CAUSE: Lightning

FINAL SUMMARY

The 2011 fire season started late, and was fairly quiet. The most significant period was late-August through mid-September. A very wet spring and early summer delayed the onset of typical fire season conditions by at least a month. Extreme fuel conditions developed in 2010, but were short-lived. Critical ERC values were realized for about 2-3 weeks in August. The most extreme period was August 10th through August 30th. There were two Red Flag events, which was a little below average for any given year. Lightning activity was less frequent,

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especially for the coast, coast range, and the North Oregon and South Washington Cascades and foothills. Antecedent conditions, including snow pack and spring precipitation, among other things, resulted in a later-than-normal start to the peak fire season. Frequent wetting rain events persisted into late-June, which helped to maintain very low fuel indices. The wet spring severely curtailed prescribed burn activity. The only major heat wave of the season occurred in late-August, immediately followed by an offshore event and a thermal trough passage. Dry spells varied from 80 days in the Coast Range zones, to 45 days in the Central Oregon Cascades and foothills. The forecast area had three large fires.

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